

PROFESSIONAL SERVICES MARKET DIRECTIONS

INPUT

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs.

Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed in 1974, INPUT has become a leading international planning services firm. Clients include over 100 of the world's largest and most technically advanced companies.

Offices

NORTH AMERICA

Headquarters
1943 Landings Drive
Mountain View, CA 94043
(415) 960-3990
Telex 171407

New York
Parsippany Place Corp. Center
Suite 201
959 Route 46 East
Parsippany, NJ 07054
(201) 299-6999
Telex 134630

Washington, D.C.
8298 C, Old Courthouse Rd.
Vienna, VA 22180
(703) 847-6870

EUROPE

United Kingdom
INPUT
41 Dover Street
London W1X 3RB
England
01-493-9335
Telex 27113

Italy
Nomos Sistema SRL
20124 Milano
Viale Vittorio Veneto 6
Italy
228140 and 225151
Telex 321137

Sweden
Athena Konsult AB
Box 22232
S-104 22 Stockholm
Sweden
08-542025
Telex 17041

ASIA

Japan
ODS Corporation
Dai-ni Kuyo Bldg.
5-10-2, Minami-Aoyama
Minato-ku,
Tokyo 107
Japan
(03) 400-7090
Telex 26487

PROFESSIONAL SERVICES MARKET DIRECTIONS

PROFESSIONAL SERVICES MARKET DIRECTIONS

ABSTRACT

This survey of the professional services marketplace provides analysis, competitive assessment, and five-year forecasts of the market for the period 1985-1990.

Included in the report are detailed analyses of the viewpoints of users and vendors that reveal different priorities. The recommendations provided range from basic strategies for success to meeting changing resource demands.

This report contains 171 pages, including 64 exhibits.

PROFESSIONAL SERVICES MARKET DIRECTION

CONTENTS

	<u>Page</u>
I INTRODUCTION	i
A. Objective	i
B. Scope and Use	i
C. Methodology	2
D. Report Organization	5
II EXECUTIVE SUMMARY	9
A. Steady Growth Forecasted For Professional Services Businesses	10
B. Fragmentation of Professional Services Competition to Continue	12
C. Users and Vendors Express Different Priorities	14
D. IS Management Needs More Reasons to Use Professional Services	16
E. New Tools, Skills, and Marketing Approaches to Be Used	18
F. Specialization Is the Key to New/Growth Opportunities	20
G. Strategic Planning Needed to Steer Professional Services Growth	22
III USER VIEWPOINTS	25
A. User Characteristics	25
1. Professional Services Market Characteristics	25
2. Survey Respondent Characteristics	27
B. User Spending Patterns	30
1. PS Expenditure Levels	30
2. Distribution of PS Spending	30
3. Factors Favoring External and Internal Sources	33
4. Sources for Specific Needs	35
C. Impacts on Respondent Decisions	35
1. Economic Impacts	35
2. IS Staff Shortages	37
3. Technology	38
4. End-User Computing	38
5. Role of IS As a Competitive Tool	41
D. User Satisfaction	43
1. Vendor Competence	43
2. PS Vendor Selection Criteria	43

	<u>Page</u>
E. Skills and Services Wanted by Users	47
1. Needed But Not Available	47
2. Special Application/System Development Plans	47
3. IS Staff Skills Needed	50
F. Growing Opportunities for PS Business	53
G. Contracting Methods	56
1. Contracting Approach	56
2. Fair Cost/Price Estimates	57
3. Single Vendor Approach	57
IV PROFESSIONAL SERVICES VENDOR VIEWPOINTS	61
A. Professional Services Vendor Characteristics	61
1. Professional Services Market Structure	61
2. PS Vendor Survey Respondent Characteristics	63
3. PS Business Distribution	63
B. New/Growth Opportunities	66
1. Significant Impacts on PS Business	66
2. Ratings of PS Business Opportunities	71
3. New Skills Required	73
4. Working Relationships	75
5. Investments for PS Business Success	79
C. Market Development	81
1. PS Market Selection	81
2. PS Prospect Selection	81
3. PS Business Promotion	81
D. PS Business Development	83
1. Profit Margins in the PS Business	83
2. Improving PS Profit Margins	83
V PROFESSIONAL SERVICES MARKET ANALYSIS AND FORECASTS	87
A. Market Forecast	87
1. Total Market Forecast	87
2. Commercial PS Market Forecast	91
3. Vendor Viewpoints of Short-Term Market Growth	91
B. Trends in Professional Services Markets	94
1. Impact of the Federal Government	94
2. Consulting Services	96
3. Software Development	97
4. Professional Services Facilities Management (FM)	98
5. Systems Integration (SI)	99
6. Education and Training	101
7. PS Grey Area	110
VI COMPETITIVE ANALYSIS	111
A. Professional Services Competitive Environment	111
1. Components of the PS Business	111
2. Competition in the PS Market Today	112

	<u>Page</u>
3. Competition For Commercial PS	112
4. PS Vendor Performance	117
B. Vendor Viewpoints on the Competitive Environment	127
1. Impacts on PS Marketplace	127
2. Dominant Competition Today	128
3. Emerging Competition	129
4. Factors For Success	131
C. Professional Services Segment Competition	131
1. Independent PS Companies	131
2. Accounting and Management Consulting Firms	133
3. Subsidiary Operations	133
4. System Manufacturers	133
5. Other Types of PS Vendors	136
D. Company Profiles	137
1. American Management Systems, Inc., Arlington (VA)	137
2. Computer Horizons Corporation, New York (NY)	137
3. Computer Sciences Corporation, El Segundo (CA)	140
4. Computer Task Group, Inc., Buffalo (NY)	142
5. Science Application International Corporation, La Jolla (CA)	144
VII CONCLUSIONS AND RECOMMENDATIONS	147
A. Basic Strategies For Success	147
1. Seeking the "High Ground" of Specialization	147
2. Scenario for Success	148
B. Vendors Need to Be More in Touch with the Buyers	149
1. Differences of Opinion on Impact Factors	149
2. Different Views of Application Priorities	149
C. Market Selection Strategies	150
1. Market Selection by Industry	150
2. Extending the Customer Base by Cooperative Action	151
D. Meeting Changing Resource Demands	151
1. Source of Key Personnel	151
2. Using Federal Business to Fund Support Services	152
3. Funding Product Development	152
APPENDIX A: QUESTIONNAIRE	155
APPENDIX B: SURVEY FORMS	163
APPENDIX C: RELATED INPUT REPORTS	171



Digitized by the Internet Archive
in 2014

<https://archive.org/details/21598MSSMxx85Professional>

PROFESSIONAL SERVICES MARKET DIRECTIONS

EXHIBITS

		<u>Page</u>
I	-1 IS User Respondent Characteristics	4
	-2 Professional Services Respondent Characteristics	6
II	-1 U.S. Commercial Professional Services Market, 1985-1990	11
	-2 Commercial Professional Services Market Shares by Type of Firm	13
	-3 User and Vendor Ratings of Market Factors and Needs	15
	-4 Factors Favoring In-House versus Professional Services Solutions	17
	-5 Professional Services Vendor Strategies for Success	19
	-6 Growth Areas for Professional Services	21
	-7 Professional Services Business Strategies	23
III	-1 Professional Services Market by Industry Sector	26
	-2 Characteristics of Respondent IS Departments	28
	-3 IS Scope of Responsibility	29
	-4 Respondent Expenditure by Type of Professional Service	31
	-5 Distribution of Professional Services Spending by Target Computer Size	32
	-6 Factors Favoring External and Internal Sources	34
	-7 Plans to Use External Sources	36
	-8 End-User Computing Support Activities	39
	-9 User Examples of IS As a Competitive Tool	42
	-10 Opinion of Sources for Professional Services	44
	-11 Respondent Rating of Professional Services Vendor Selection Criteria	45
	-12 Plans for State-of-Technology Systems Development	48
	-13 Respondent Staff Needs for Special Expertise	51
	-14 Comparison of User Needs with Sources	52
	-15 Assessment of Professional Services Opportunities	54
	-16 Estimates of "Fair Fees" for Professional Services	58
IV	-1 Professional Services Market Structure	62
	-2 Top 25 Commercial Professional Services Vendors	64
	-3 Professional Services Vendor Respondent Characteristics	65
	-4 Professional Services Business Distribution for Survey Respondents	67
	-5 Factors with Significant Impact on Professional Services Markets	68

		<u>Page</u>
	-6 Rating of Product Areas for Professional Services Business Opportunities	72
	-7 Required Skills for Success in Professional Services Markets	74
	-8 Examples of Professional Services Marketing Agreements	77
	-9 Professional Services Distribution Channels	78
V	-1 Total Professional Services Market, 1985-1990	88
	-2 Total Professional Services Market by Service Type, 1985-1990	89
	-3 Professional Services Markets by Industry Sector, 1985-1990	90
	-4 Commercial Professional Services Market, 1985-1990	92
	-5 Commercial Services Market by Service Type, 1985-1990	93
	-6 Current Examples of Computer-Based Training (CBT)	103
	-7 Leading Vendors of Authoring Systems	105
	-8 Leading Vendors of Courseware	107
VI	-1 Professional Services Market Distribution for 1985	113
	-2 Top 10 Professional Services Companies in the U.S.	114
	-3 Professional Services Market Forecasts for 1990	115
	-4 Commercial Professional Services Market Distribution Forecast by Service	116
	-5 Top 10 Commercial Professional Service Companies in 1984 U.S. Revenue	118
	-6 Commercial Consulting Professional Services Leaders in U.S.	119
	-7 Commercial Software Development Services Leaders in U.S.	120
	-8 Commercial Education and Training Services Leaders in U.S.	121
	-9 Commercial Professional Services Facilities Management Leaders in U.S.	122
	-10 Commercial Professional Services Markets Shares by Type of Company	123
	-11 Public Professional Services Vendors Performance	124
	-12 Revenues of Public Professional Services Companies	125
	-13 Net Income of Public Professional Services Companies	126
	-14 Vendor Respondent Concern for Competition	130
	-15 Top 25 Independent Professional Services Firms in the U.S. Commercial Market	132
	-16 Top 10 Accounting and Management Consulting Firms in Commercial Professional Services	134
	-17 Top 10 Subsidiary Type Firms in Commercial Professional Services	135
	-18 American Management Systems, Inc. Five-Year Financial Summary	138

	<u>Page</u>
-19 Computer Horizons Corporation Five-Year Financial Summary	139
-20 Computer Sciences Corporation (CSC) Five-Year Financial Summary	141
-21 Computer Task Group, Inc. Five-Year Financial Summary	143
-22 Science Applications International Corporation (SAIC) Five-Year Financial Summary	145

I INTRODUCTION

I INTRODUCTION

A. OBJECTIVE

- INPUT believes that the rapidly changing structure of the computer and communications industries will continue to offer above average growth potential for professional services. Many new opportunities are emerging in integrated digital communications, computer-aided decision making, computer-based training, and multi-application systems integration.
- The purpose of this report is to assist professional services vendors and interested companies, such as software suppliers, retailers, and other information services companies, in understanding the changes in the market and competitive environment. This includes identifying key factors for profitability and revenue growth and providing direction for dealing with changes in technology and methodologies.

B. SCOPE AND USE

- This report considers professional services for the commercial sector of the economy, exclusive of the federal government. Market forecasts and competitive analysis include all types of professional services vendors and are not limited to independent firms specializing in this business.

- User needs, buyer requirements, and vendor attitudes are presented for the commercial segment of this market. This report focuses on information systems (IS) consulting, software development, and IS training. Facilities management (FM) is not a significant element of the professional services commercial market. Systems integration is just beginning to find favor among commercial buyers and will be covered by a special INPUT report on that market segment.
- Professional services can be delivered either directly or through hardware manufacturers and software suppliers. In many cases, professional services are offered by firms as an incremental and auxiliary service in support of other products. These services are included in the analyses and forecasts of the market.
- Executives can use this report to assist in the planning and marketing of professional services, setting profit margin goals, and developing marketing agreements which extend their potential customer base.

C. METHODOLOGY

- The research program supporting this report considered the following issues from the information systems (IS) user viewpoint:
 - Plans and budgets for professional services.
 - Distribution of these services between mainframe and personal computers (PCs).
 - Evaluation and selection of professional services vendors.

- Factors favoring professional services vendors over in-house alternatives.
 - Policies and activities supporting IS management of end-user computing.
 - Impact of the economy, technology, and the shortage of IS professional staff on the use of professional services.
 - Opinions on contract terms and estimates of fair fees for professional services.
- INPUT conducted interviews with a total of 40 user IS groups to develop its findings in this report. The characteristics of these IS user respondents are summarized in Exhibit I-1.
 - The supporting field research conducted among professional services vendors considered the following issues from their viewpoints.
 - Outlook for the market in 1986.
 - Factors with a significant impact on this market over the next two years.
 - Changes in the competitive environment.
 - Key factors for success, new skills needed, and working arrangements to extend the customer base.
 - Strategies for selecting markets and promoting services.
 - Opinions on new and growth service opportunities.
 - Estimates of profit margins and strategies for improvement.

EXHIBIT I-1

I.S. USER RESPONDENT CHARACTERISTICS

BY INDUSTRY	RESPONDENTS
Manufacturing	9
Banking, Finance, and Insurance	7
Energy Utilities	5
Distribution	4
Higher Education	4
Medical	3
Transportation	2
Other Industries	6
Total	40

BY I.S. BUDGET SIZE (\$ Millions)	RESPONDENTS
Very Large (> 20M)	6
Large (5 - 20M)	13
Medium (1 - 5M)	12
Small (< 1M)	9
Total	40

- INPUT conducted interviews with 25 separate professional services vendors to develop the findings of this report. The characteristics of these respondents are summarized in Exhibit I-2.
- Additional buyer requirements and vendor activities were obtained from reviews of trade publications, vendor reports, and discussions with industry experts. Prior INPUT reports were also reviewed. A list of these relevant INPUT reports is included in Appendix C.

D. REPORT ORGANIZATION

- The remainder of this report is organized as follows:
 - Chapter II is an Executive Summary formatted as a presentation with accompanying narrative for group discussion.
 - Chapter III is an analysis of buyer/user opinions and attitudes from the viewpoint of the 40 IS managers interviewed.
 - Chapter IV is a report of opinions based on the interviews with 25 professional services vendors.
 - Chapter V provides estimates of current user expenditures and forecasts of future market growth with an analysis of significant trends.
 - Chapter VI provides a competitive analysis and identifies the market share leaders by type of service and type of vendor.
 - Chapter VII summarizes INPUT's conclusions and provides specific recommendations for managers and executives.

EXHIBIT I-2

PROFESSIONAL SERVICES RESPONDENT CHARACTERISTICS

BY TYPE	RESPONDENTS
Independent Professional Services Firms	12
Subsidiary Operations	5
Software Suppliers	6
"Big 8" Accounting Firms	2
Total	25

BY SIZE IN PROFESSIONAL SERVICE SALES	RESPONDENTS
> \$100 Million	6
\$51-100 Million	6
\$11-50 Million	7
< \$10 Million	6
Total	25

BY PERCENTAGE OF PROFESSIONAL SERVICES SALES	RESPONDENTS
76% - 100%	9
26% - 75%	9
25% or Less	7
Total	25

- Appendix A contains the questionnaire used.
- Appendix B contains survey forms.

II EXECUTIVE SUMMARY

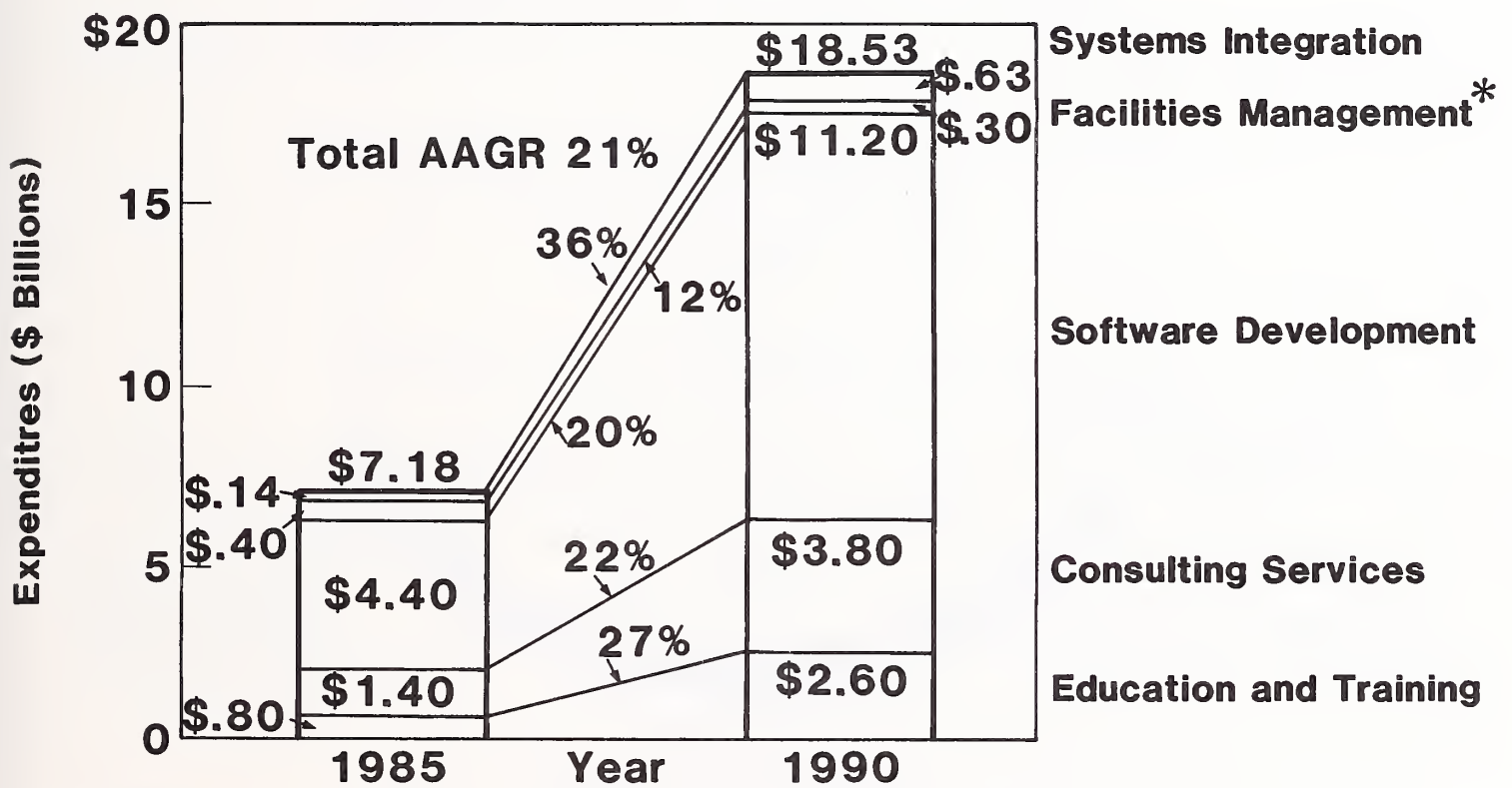
II EXECUTIVE SUMMARY

- This Executive Summary is designed in a presentation format to:
 - Help the busy reader quickly review key research findings.
 - Provide a ready-to-go executive presentation, complete with a script, to facilitate group communications.
- Key points of the report are summarized in Exhibits II-1 through II-7. On the left-hand page facing each exhibit is a script explaining the contents of the exhibit.

**A. STEADY GROWTH FORECASTED FOR PROFESSIONAL SERVICES
BUSINESSES**

- The commercial sector of the professional services (PS) market, exclusive of the federal government, will increase to \$18.53 billion in 1990 from \$7.18 billion in 1985 at an average annual rate of 21%.
- Software development will continue as the largest segment of this market, reaching \$11.2 billion in 1990. The highest growth rates, however, will occur in the areas of:
 - System integration, to \$630 million at a 36% rate.
 - Education and training, to \$2.6 billion at a 27% rate.
- Banking, finance, and manufacturing will continue to provide the largest markets for PS, accounting for 55% of total sales. The highest growth rates will be in:
 - Telecommunications, to \$.97 billion at a 26% rate.
 - Banking and finance, to \$3.50 billion at a 23% rate.
 - Medical and health services, to \$0.60 billion at a 22% rate.
 - Manufacturing, to \$6.68 billion at a 22% rate.
- The most significant impacts on PS business opportunities will come from:
 - Proliferation of end-user computing and workstations.
 - Telecommunications industry deregulation and AT&T divestiture.
 - Economic cycles within specific industries.

U.S. COMMERCIAL PROFESSIONAL SERVICES MARKET 1985-1990

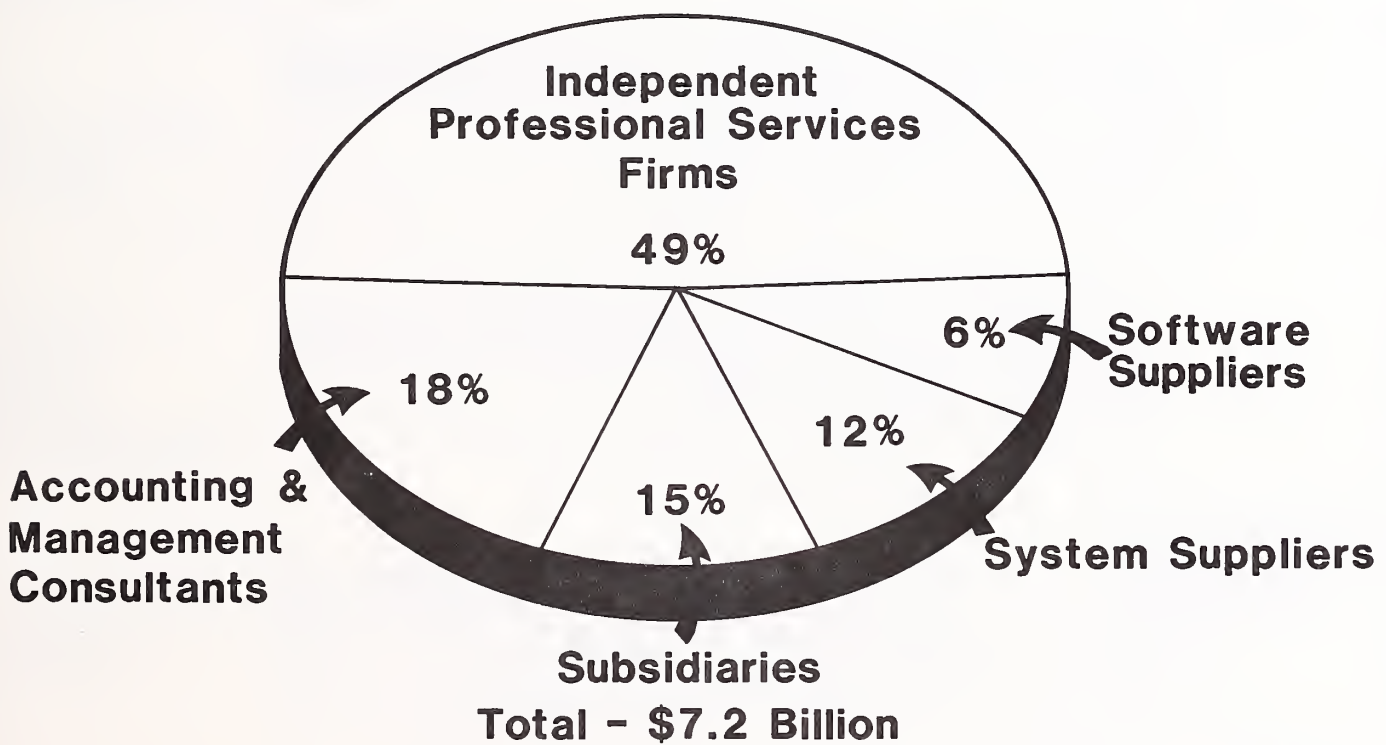


*User-Owned, Contractor-Operated

B. FRAGMENTATION OF PROFESSIONAL SERVICES COMPETITION TO
CONTINUE

- Many different types of companies have a share of the PS marketplace, including:
 - Independent PS vendors with a 49% share.
 - Accounting and management consulting firms with 18%.
 - Subsidiaries of large companies in other industries at 15%.
 - Systems manufacturers with a 12% share.
 - Independent software and processing services with 6%.
- Consolidations within the hardware and software businesses will have little impact on the nature of the competitive environment for PS because:
 - New competition will come from AT&T and the Regional Bell Operating Companies (RBOCs).
 - More specialty markets will develop around decision support, AI and expert systems, and network implementations.
 - Systems manufacturers, particularly IBM, will do much more business through system integrators and value added resellers (VARs).
 - The PS role of microcomputer dealers will increase in the areas of training and custom microcomputer programming.

COMMERCIAL PROFESSIONAL SERVICES MARKET SHARES BY TYPE OF FIRM



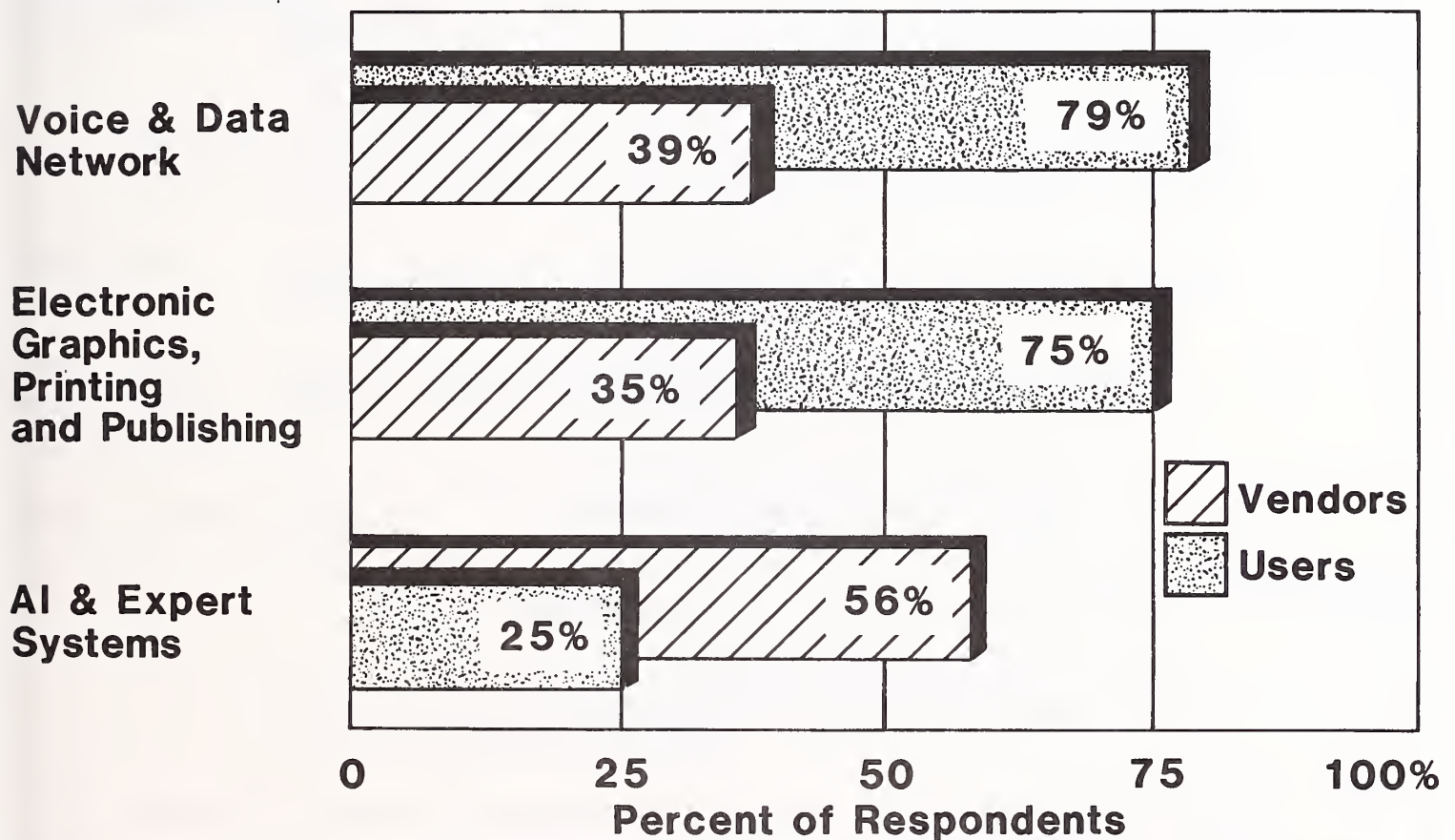
Subsidiary operations of large companies in other industries (i.e., EDS/GM, GEISCO, MMDS, BCS, McDonnell Douglas ISG)

C. USERS AND VENDORS EXPRESS DIFFERENT PRIORITIES

- Users and vendors disagree on the impact of IS staff shortages on the use of PS. Users rate the following areas much higher in importance than do vendors.
 - Voice and data communications integration.
 - Electronic graphics and printing system implementation.
 - Decision support system implementation.
- PS vendors rate the following areas as significant opportunities, yet the users interviewed are not very interested in PS alternatives.
 - Data base setup.
 - Information center setup.
- The role of IS as a strategic element of a company's competitive plan is increasing in many industries. Examples of tightly coupling IS into the marketing and customer service operations include:
 - Telemarketing operations automation.
 - Customer services response and dispatch.
 - Automated order entry, processing, and shipping.
 - Special document delivery.

USER AND VENDOR RATINGS OF MARKET FACTORS AND NEEDS

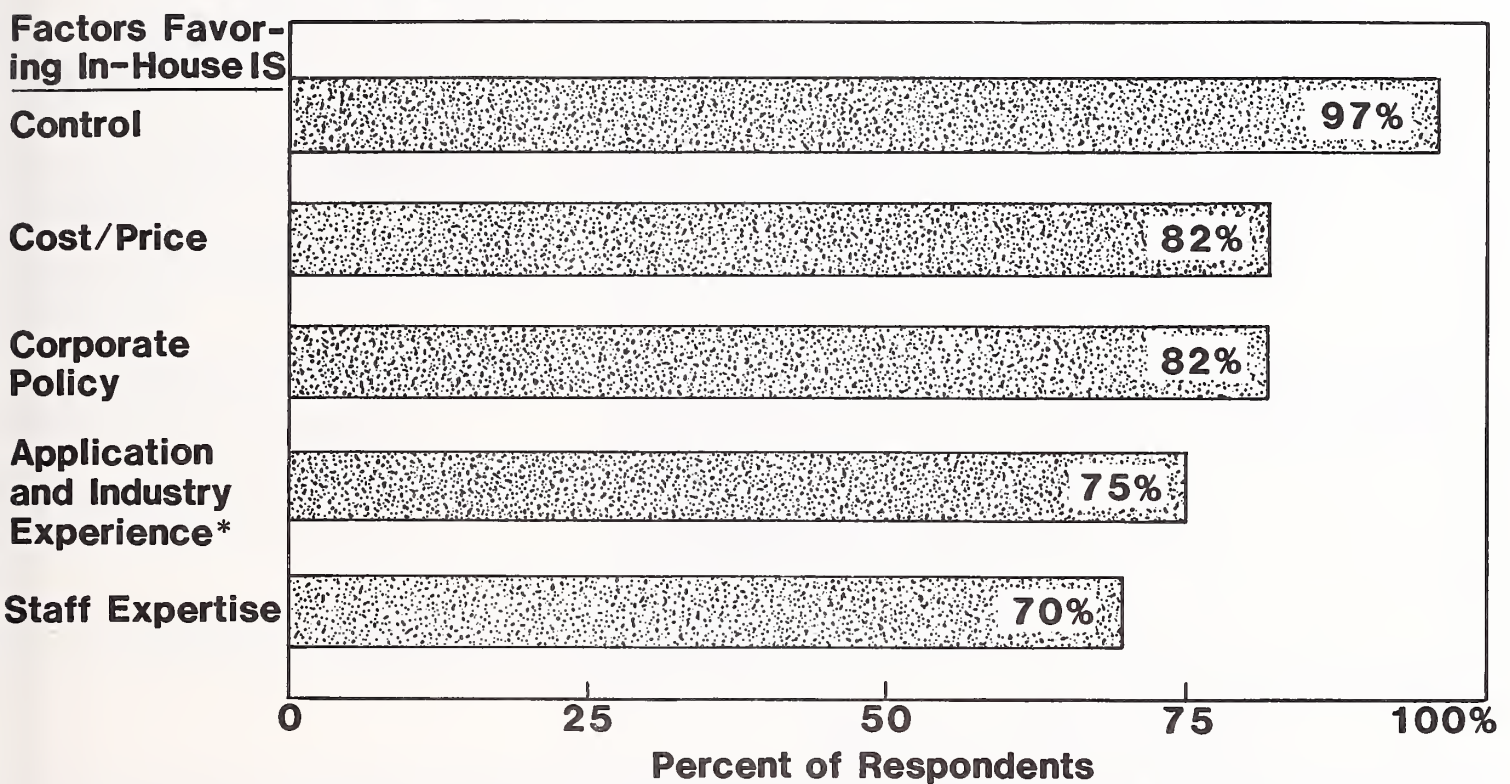
Plans/Interest



D. I.S. MANAGEMENT NEEDS MORE REASONS TO USE PROFESSIONAL SERVICES

- The most significant reasons given by IS management interviewed for considering PS vendor alternatives relate more directly to a vendor's size and staff availability than to any other factors.
- The factors that IS management believes favor in-house alternatives are all associated with ability to control internal staff. These users need both application and industry experience.
- When IS management does seek out PS vendors for an assignment, the rating of criteria for evaluation and selection are:
 - Prior experience with the vendor, 8.2.
 - Track record of the vendor, 7.8.
 - Both application and industry experience, 7.7.
 - Staff qualifications and individual expertise, 7.3.
 - Price quote from the vendor, 6.9.
- IS management expresses a preference for software producers as PS vendors (55%). Independent PS firms are preferred by 30% of the survey respondents.

FACTORS FAVORING IN-HOUSE VERSUS PROFESSIONAL SERVICES SOLUTIONS



*Users emphasized that BOTH application and industry experience are necessary.

E. NEW TOOLS, SKILLS, AND MARKETING APPROACHES TO BE USED

- Most of the PS vendors interviewed (88%) are of the opinion that IS staff shortages will have a significant impact on their business in the next two years, resulting in:
 - Shortages of critical skills in IS groups.
 - Higher staff costs for PS firms.
- The skills in demand by PS vendors are shifting from programming to business analysis and user training. Personnel with specific applications and industry experience will be in more demand than their technical counterparts.
- The steps to success for PS vendors will include:
 - Gaining a critical mass in specific applications and industry areas offering steady growth potential.
 - Integrating PS business into development of proprietary productivity tools.
 - Developing supporting computer-based training tools for both customer and PS staff.
 - Extending the business relationship with the customer by offering ongoing support and maintenance plans.
 - Extending staff experience and increasing productivity by using fourth generation languages to build tools.

PROFESSIONAL SERVICES VENDOR STRATEGIES FOR SUCCESS

New Skills Needed

Application/ Industrial Experts*

**Computer-Based Training
Experts**

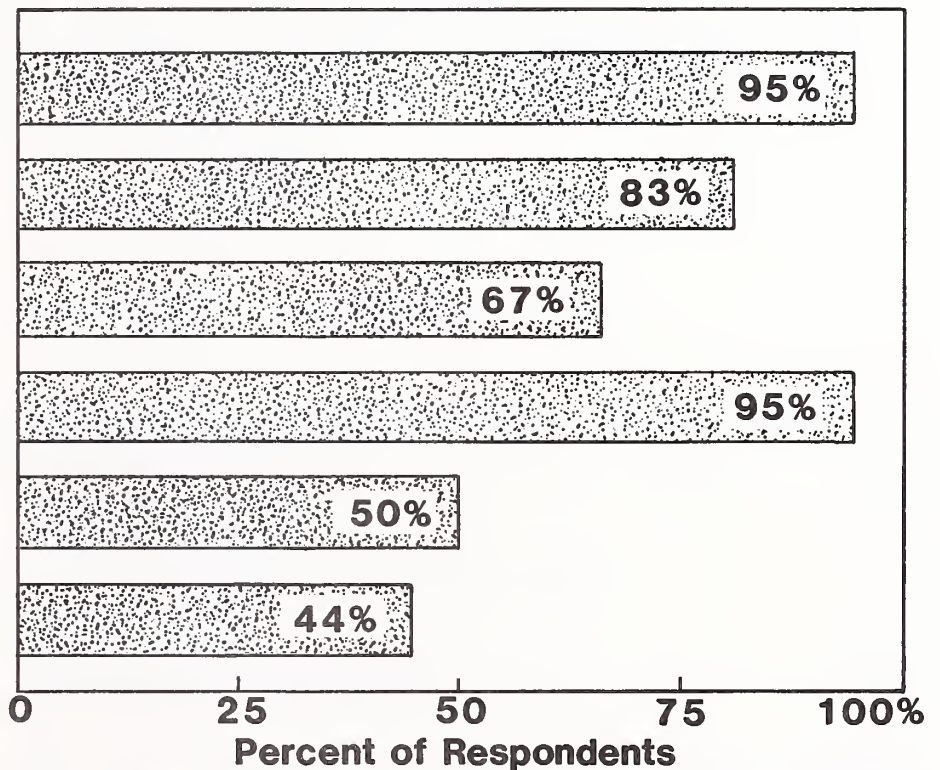
**Fourth-Generation Language
Experts****

Working Relationships

Marketing Agreements

Licensing Agreements

Joint-Venture Agreements



* Vendors stressed that BOTH application and industry experience is necessary.

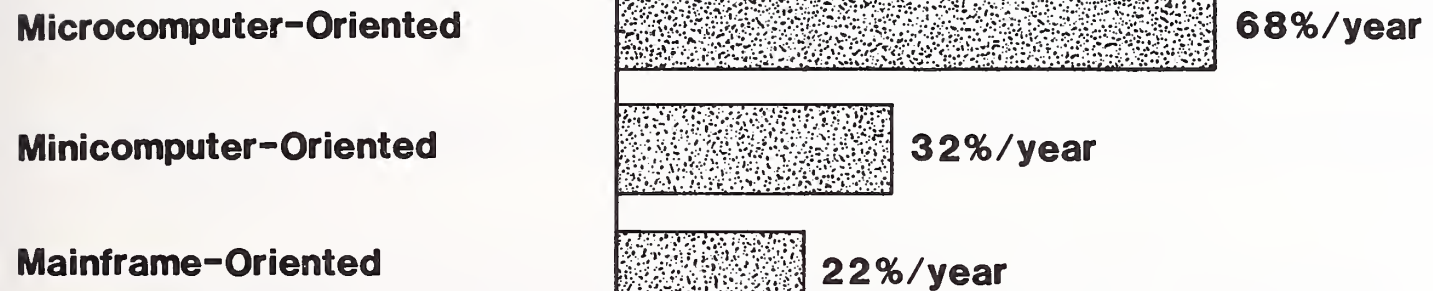
** Vendors stressed the need for fourth-generation languages.

F. SPECIALIZATION IS THE KEY TO NEW/GROWTH OPPORTUNITIES

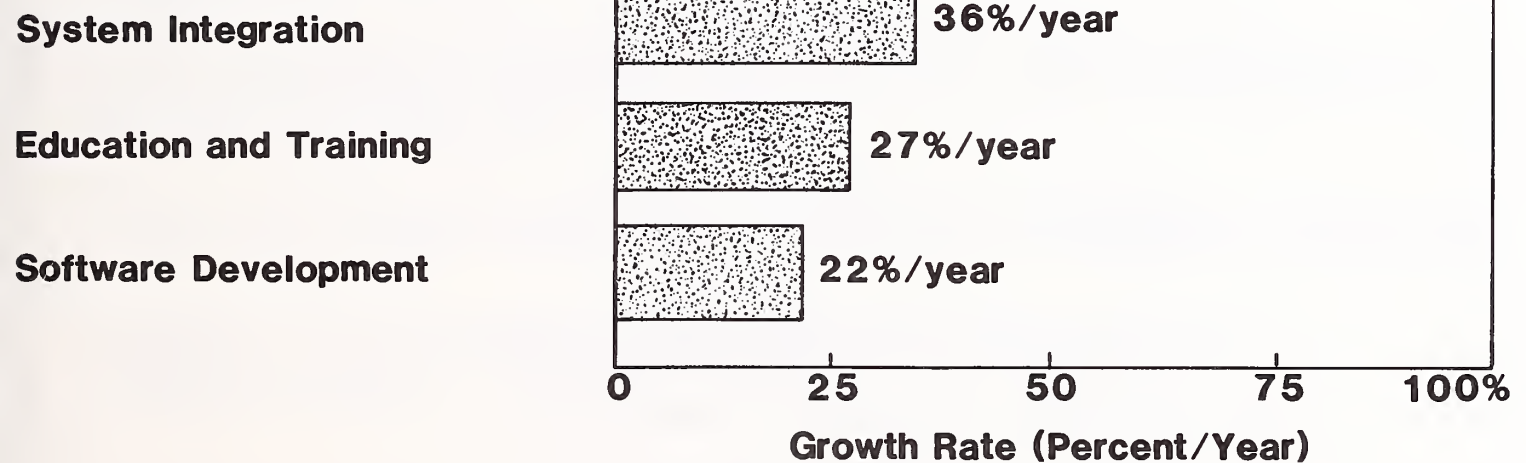
- Specialization has two necessary dimensions: industry and application. Vendors need to develop expertise and specialization by both.
- Industry focus is essential to both growth and profitability in the PS business. Deregulation is playing a major role in opening up new opportunities. Prime areas for specialization are:
 - Telecommunications.
 - Banking and financial services.
 - Manufacturing.
- The most significant growth market over the next 10 years will be in the areas of:
 - System integration of digital communications networks.
 - Design, implementation, and support of decision support.
 - Training and support services for end-user computing.
- Profit margins will be substantially improved by development of the synergy between PS and program products. The new frontier for this is in the use of fourth generation languages for prototyping and the development of productivity tools.

GROWTH AREAS FOR PROFESSIONAL SERVICES

By System Orientation



By Type of Service



G. STRATEGIC PLANNING NEEDED TO STEER PROFESSIONAL SERVICES GROWTH

- The PS sector in most firms is either opportunistic or incremental to some other primary product. Planning of PS market strategies is minimal for most vendors:
 - Local offices have control of PS market development on a piecemeal basis.
 - Product sales define PS market strategies for software and system suppliers.
 - Prospecting and promotion for PS is a passive activity at most firms.
- PS vendors without proprietary software for leverage generate profit margins one-half the size of firms with products. Income performance of independent PS vendors reflects this sorry situation. Improvements require:
 - Development of specialized staff where some dominance can be achieved.
 - Development or acquisition through marketing arrangements programs of products in demand in these special areas.
 - Inclusion of post-implementation services as a standard part of the services offered.
 - Investment in automated bidding and contract administration tools to cut G&A costs.

PROFESSIONAL SERVICES BUSINESS STRATEGIES

- **Professional Services Need to Be Part of the Strategic Plan**
 - **Plan for Extended Professional Services to Support Other Products**
 - **Develop a Professional Services and Product Integration Strategy**
 - **Profit Margins for Professional Services Will Never Improve Without Specialization**
 - **Seek the “High Ground” of Application and Industry Expertise**
 - **Invest in Automation of the Bidding and Contract Administration**
-

III USER VIEWPOINTS

III USER VIEWPOINTS

A. USER CHARACTERISTICS

I. PROFESSIONAL SERVICES MARKET CHARACTERISTICS

- The prime target for the sale of professional data processing services (PS) is within the Fortune organizations, which, of course, coincides with the market for computer systems. Multiple buying units exist within virtually all of these organizations. The Fortune 1400 companies are estimated to average some 3.2 major data centers each. This would then multiply out to a total of 4,480 selling points in the primary market. Among this buying population, spending for data processing products, services, and staff varies widely by industry.
- In 1985, industry estimates are for an increase of 7.4%, based on survey research of 645 organizations. This increase also varies widely between industries.
- Professional IS services, on the average, are expected to account for a total of 2.7% of the average budget in 1985, up by 18% over 1984 levels. Total spending for PS by the private commercial sector is estimated at \$7.18 billion for 1985. The forecast for user spending for PS is summarized by industry sector in Exhibit III-1.

EXHIBIT III-1

PROFESSIONAL SERVICES MARKET BY INDUSTRY SECTOR

INDUSTRY SECTOR	PROFESSIONAL SERVICES MARKET (\$ Millions)			
	1985 (\$ Millions)	Change (Percent)	1990 (\$ Millions)	AAGR (Percent)
Discrete Manufacturing	\$1,681	20%	\$4,579	22%
Process Manufacturing	791	10	2,101	22
Transportation	137	12	305	17
Utilities	67	10	103	9
Telecommunications	305	25	968	26
Distribution	486	14	1,064	17
Banking & Finance	1,254	21	3,500	23
Insurance	706	16	1,757	20
Medical	220	20	598	22
Education	65	7	101	9
Services	140	15	302	17
State & Local Govt.	1,121	15	2,608	18
Other Industries	210	15	485	10
Commercial Total	\$7,183	18%	\$18,471	21%
Federal Government	3,343	21	7,845	17
Total	\$10,526	19%	\$26,316	20%

2. SURVEY RESPONDENT CHARACTERISTICS

- The IS managers surveyed for this report numbered 40 in total. Most of these organizations operated IBM computer systems and had an IS operating budget of at least \$1 million for 1985. The range for IS budgets for these users ran from \$300,000 to almost \$1 billion. Exhibit III-2 summarizes the industry and size characteristics of this survey population.
- The mean IS budget for these respondents was \$7.7 million in 1985. Overall, spending was reported up by an average of 8.1%. This compares to an average increase of 7.4% reported by Datamation based on a survey of 645 users. The INPUT survey respondents expect their 1986 IS budgets to be up by an average of only 7.0%. Almost one-half (43%) of these users feel the direct impact of the economy on their budgets.
- The responsibilities of these respondents today extend beyond traditional data processing, as shown in Exhibit III-3. Virtually all of these users are in the process of major system implementation efforts. The "new" applications planned for 1986 include:
 - Basic financial and accounting applications such as payables, receivables, asset management, and cash flow management.
 - Operations management applications such as project control, production management, inventory control, and distribution control.
 - Customer-oriented applications such as order entry, customer information systems, and customer service systems.
 - Payroll and human resource information management systems.
- Certainly, none of these applications are totally new to these users. They are, however, new implementations and expansions which go significantly beyond

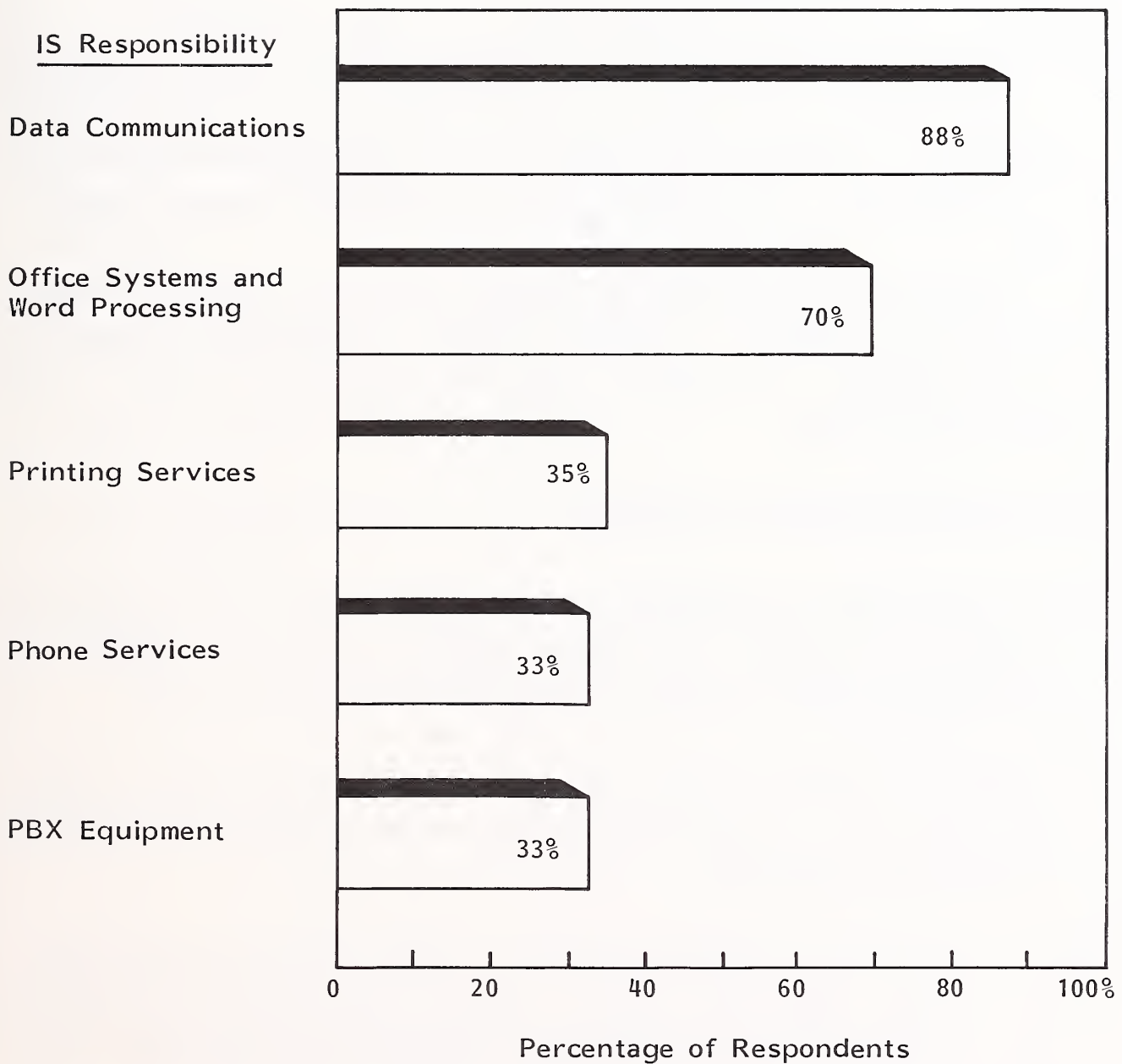
EXHIBIT III-2

CHARACTERISTICS OF RESPONDENT I.S. DEPARTMENTS

BY INDUSTRY	RESPONDENTS
Manufacturing	9
Banking, Finance, and Insurance	7
Energy Utilities	5
Distribution	4
Higher Education	4
Medical	3
Transportation	2
Other Industries	6
Total	40
BY I.S. BUDGET SIZE (\$ Millions)	RESPONDENTS
Very Large (> 20 M)	6
Large (5 - 20M)	13
Medium (1 - 5M)	12
Small (< 1M)	9
Total	40

EXHIBIT III-3

I.S. SCOPE OF RESPONSIBILITY



the maintenance level. A total of 63 applications were noted from 400 organizations. Of these, one-half were expected to use purchased software products.

B. USER SPENDING PATTERNS

1. PS EXPENDITURE LEVELS

- Purchases of PS for these respondents averaged 2.2% of their IS budgets in 1985, compared to an average of 2.7% for 1984 from a much larger sample of 645 users. The average expenditures by service type for these users are shown in Exhibit III-4. Total PS expenditures by all respondents averaged \$156,000.
- Training services are universally in demand. All of these users have increased spending for training in 1985; the average is \$37,000 with a range from \$1,000-200,000. The outlook for 1986 is for more of the same with a 12% increase expected.

2. DISTRIBUTION OF PS SPENDING

- The distribution of PS spending between mainframe and microcomputers (personal computers) is of increasing interest. The results for 1985 are not surprising; however, they form a quantitative base for further study.
- Mainframe-oriented services clearly dominate the IS budgets today, as shown in Exhibit III-5. These figures, however, could be somewhat misleading, particularly for training.
 - Some PS spending comes directly from the end-user budgets, bypassing the IS totals. For example, a significant part of the PS revenues for the accounting and management consulting firms comes directly out of

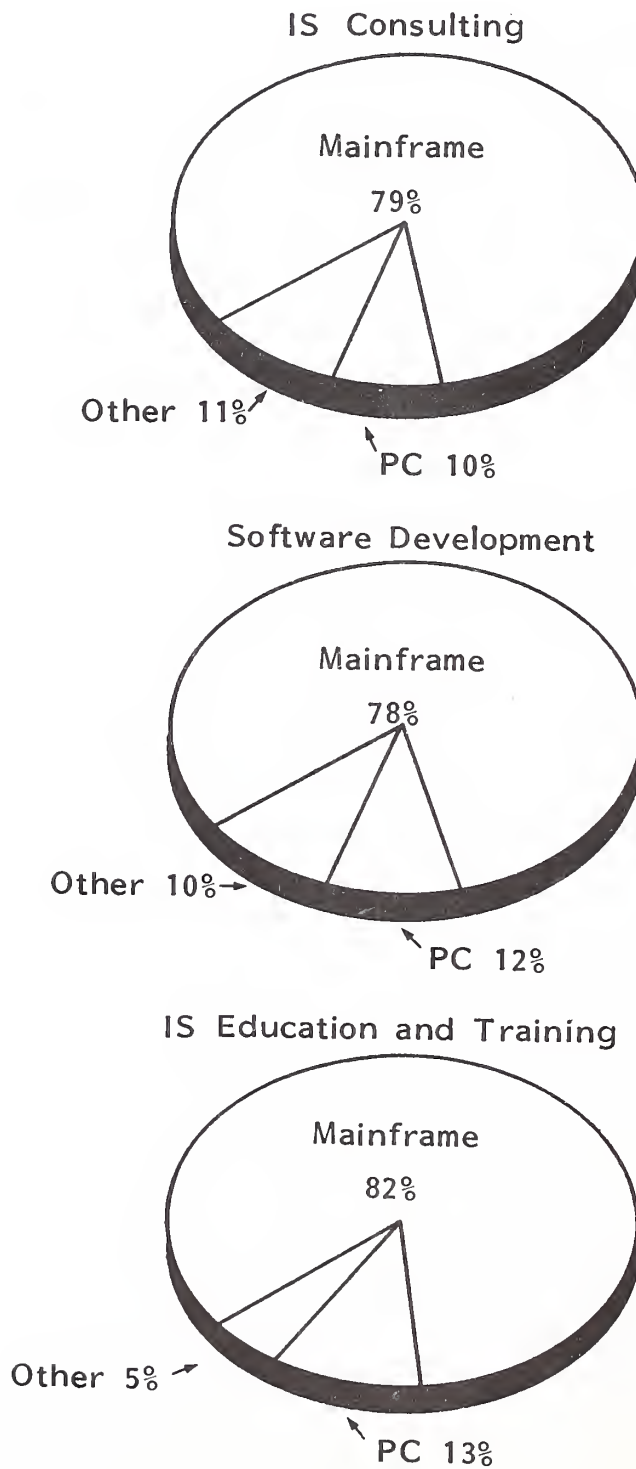
EXHIBIT III-4

RESPONDENT EXPENDITURE BY TYPE OF PROFESSIONAL SERVICE

SERVICE TYPE	ACTIVE (Percent)	AVERAGE EXPENDITURES (\$ Thousands)	TOTAL \$ BILLIONS (Group)
Education and Training	100%	\$ 37	\$1,254
Consulting	53	151	2,574
Software Development	50	159	1,911
System Integration	23	124	495
Facility Management (User- Owned Equipment)	None	(N/A)	(N/A)
Total		\$471	\$6,234

EXHIBIT III-5

DISTRIBUTION OF PROFESSIONAL SERVICES
SPENDING BY TARGET COMPUTER SIZE



end-user funds rather than through the IS budgets. It is estimated that only 25% of the spending for PC-oriented training flows through the IS budgets today.

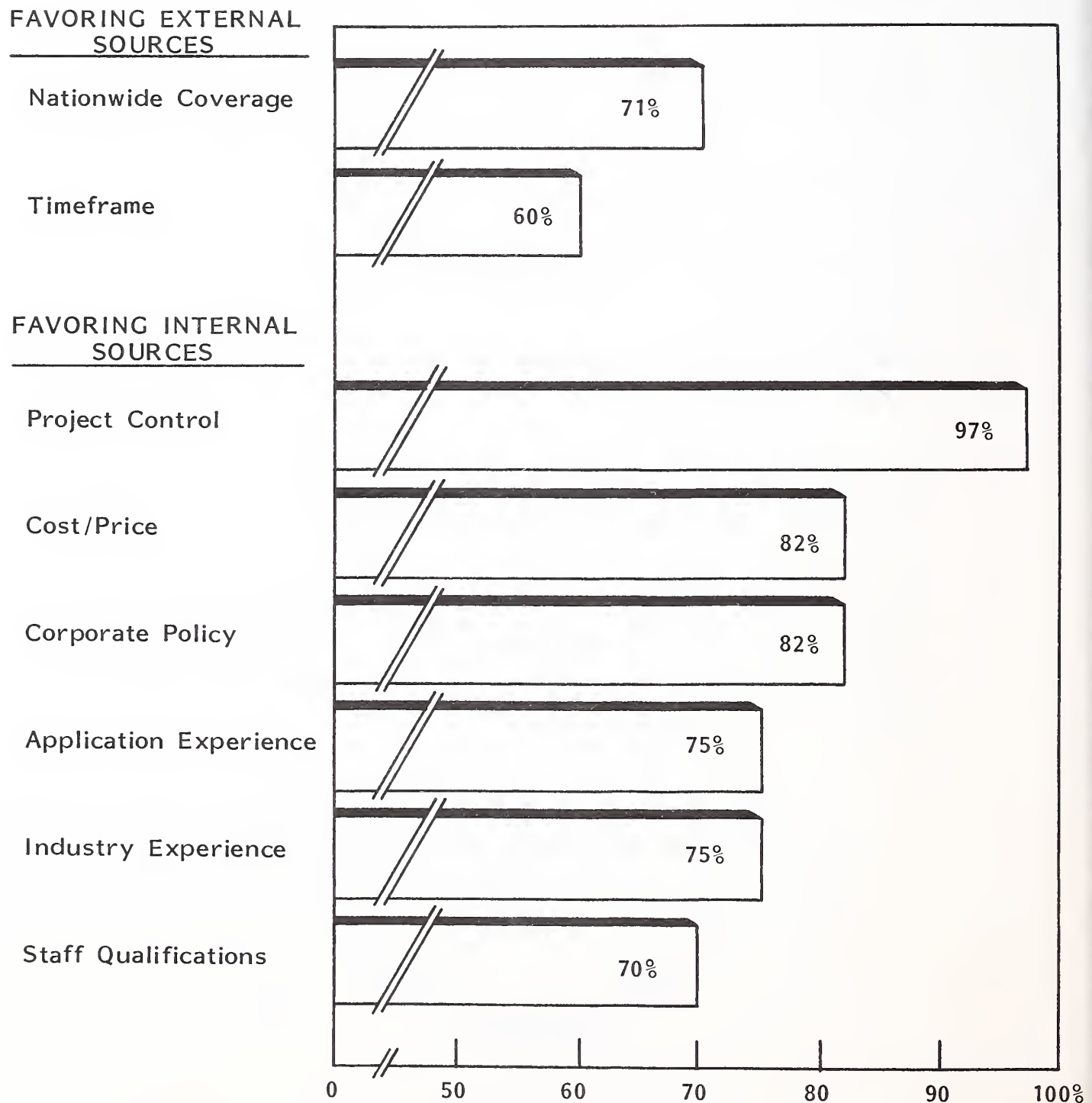
- With this assumption in mind, PC-oriented training would account for 35% of the total.

3. FACTORS FAVORING EXTERNAL AND INTERNAL SOURCES

- The respondents users feel that PS have only two significant advantages over internal sources for analysis, design, and programming. These advantages are:
 - Nationwide coverage (71%).
 - Timeframe to respond to a need (60%).
- Exhibit III-6 illustrates respondents' views on which factors favor in-house and which PC vendor solutions.
- The largest single component of the IS budget is for the in-house staff. This consumes between 35-40% of IS dollars.
- For that price, executive management expects to have the right mix of talents, experiences, and skills to support the organization under normal circumstances. However, when external events create crises, then outside PS sources are much more acceptable.
 - The most significant example today is deregulation. Deregulation has created an environment for rapid change and traditional approaches no longer fit. Deregulation is affecting the banking, transportation, and the communications industries.

EXHIBIT III-6

FACTORS FAVORING EXTERNAL AND INTERNAL SOURCES



4. SOURCES FOR SPECIFIC NEEDS

- External sources are favored, in general, for training and education. Since 80% of this is associated with the mainframe, the system supplier is favored by the IS user.
- Exhibit III-7 illustrates the users' opinions of sources for nine specific PS product areas. Outside of training, there is no strong constituency for PS in any of these other areas among these respondents. One-half of these users do expect to seek outside sources in the following areas:
 - Electronic mail system setup, 48%.
 - Micro spreadsheet design, 45%.
 - Mainframe-to-micro links, 44%.
- Communications is the one area where users today definitely feel they need additional resources and extra help. Most (75%) are looking for permanent staff to fill this need. External sources are seen as only a partial, short-term solution.

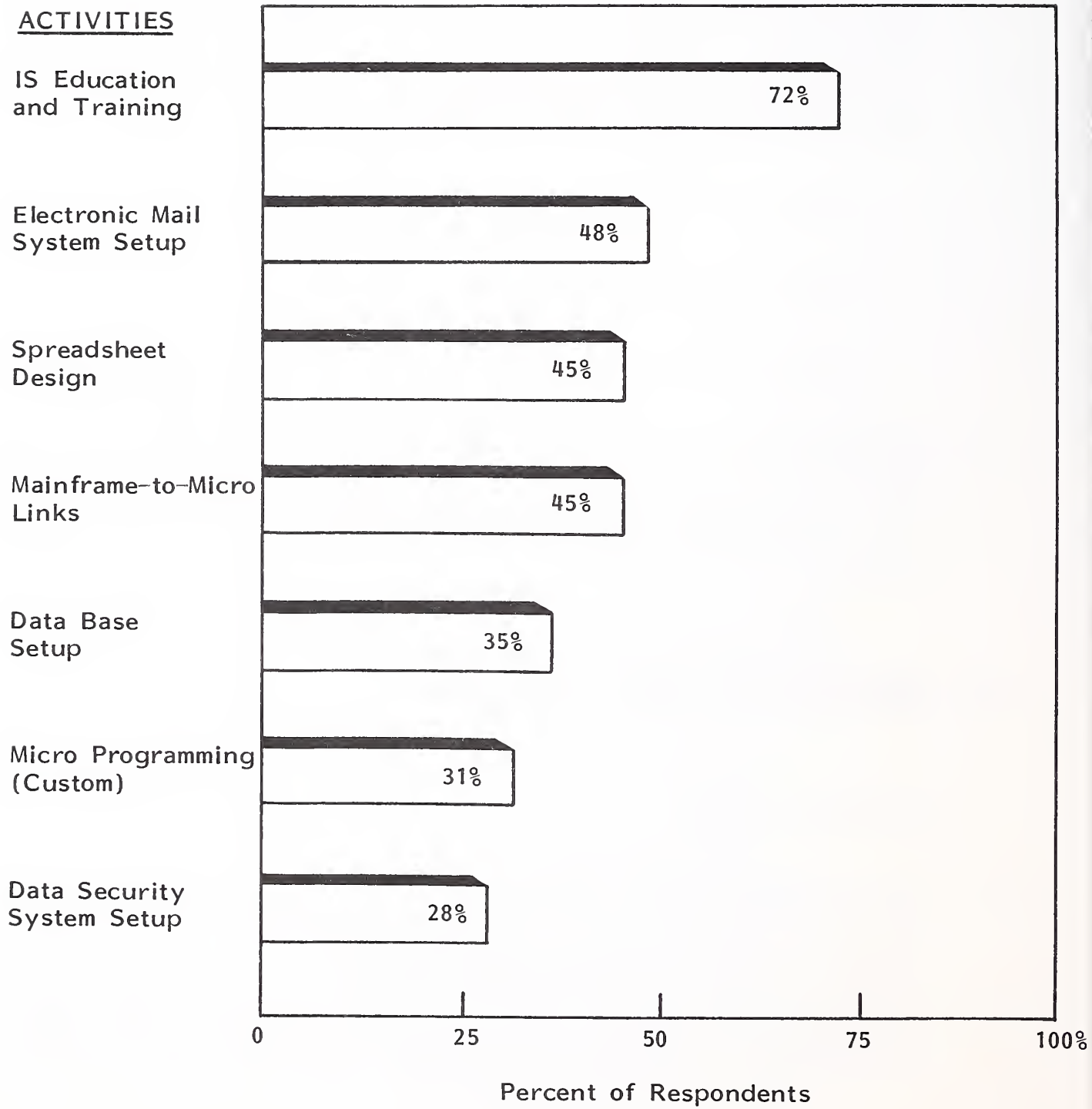
C. IMPACTS ON RESPONDENT DECISIONS

I. ECONOMIC IMPACTS

- Theoretically, one could make a case for use of PS under any set of economic conditions. In an up cycle, PS firms allow rapid growth in spite of staff shortages. In down cycle, PS firms can keep a plan on schedule without long-term commitments to permanent staff. In reality, only 43% of these respondents say that the state of the economy has a significant impact on plans for

EXHIBIT III-7

PLANS TO USE EXTERNAL SOURCES



using PS firms. If this is really the case, it means that PS business should be somewhat independent of economic cycles.

2. I.S. STAFF SHORTAGES

- Most users (60%) do not foresee a shortage of IS professionals having an impact on their implementation plans. For the minority that expect an impact, the alternatives are seen as:
 - Slowing down of the development process to accommodate available staff.
 - Increasing budgets to expand staff as necessary (i.e., buy in).
 - Increasing the use of PS firms.
- Among this minority, then, increased use of PS firms to overcome IS staff shortages is the third most likely alternative to be considered. IS staff shortages per se will not in itself be a significant factor in motivating these users to expand their purchase from PS vendors. These shortages must be coupled with other factors, such as a short timeframe or a requirement for extended geographic coverage, to be significant.
- Other sources rated the "average" Fortune company IS staff growth rate at 5.6% for 1984. Average turnover during 1984 is estimated at 4.8%. These technical professionals are more concerned with the availability of the latest technology and specific task assignments than with salary or stability. Their loyalty is professional, not organizational.
- Hardware manufacturers encourage this attitude. In another recent survey among IS professionals, the willingness to "explore" new jobs was at a 70% level among commercial applications programmers and an 84% level among scientific programmers. The reasons given for changing jobs are:

- Lack of advancement, 32%.
 - Better compensation plan, 30%.
 - More challenging opportunity, 22%.
- According to the Bureau of Labor Statistics, 553,000 programmers and 395,000 systems analysts are employees in the U.S. in the third quarter of 1985. It is unlikely that PS vendors will have much success in cornering the supply of either and thereby increasing demand on the basis of internal IS staff shortages alone.

3. TECHNOLOGY

- Only 28% of the respondents expect a specific technology to have a significant impact on their operators or use of PS firms. Among this small set of users, the one area receiving repeated mention is that of telecommunications. The key issue is the emergence of new technologies (i.e., fiber optics, digital networks, and advanced satellite systems) that could have a major effect on the costs of communications.
- This concern is greatest among banks. Among these users, IS functions are an integral part of the services offered and technology is a strategic element in their competitive environment. For this reason, these users look to the PS firms to keep them competitive by keeping them up-to-date in communications capabilities.

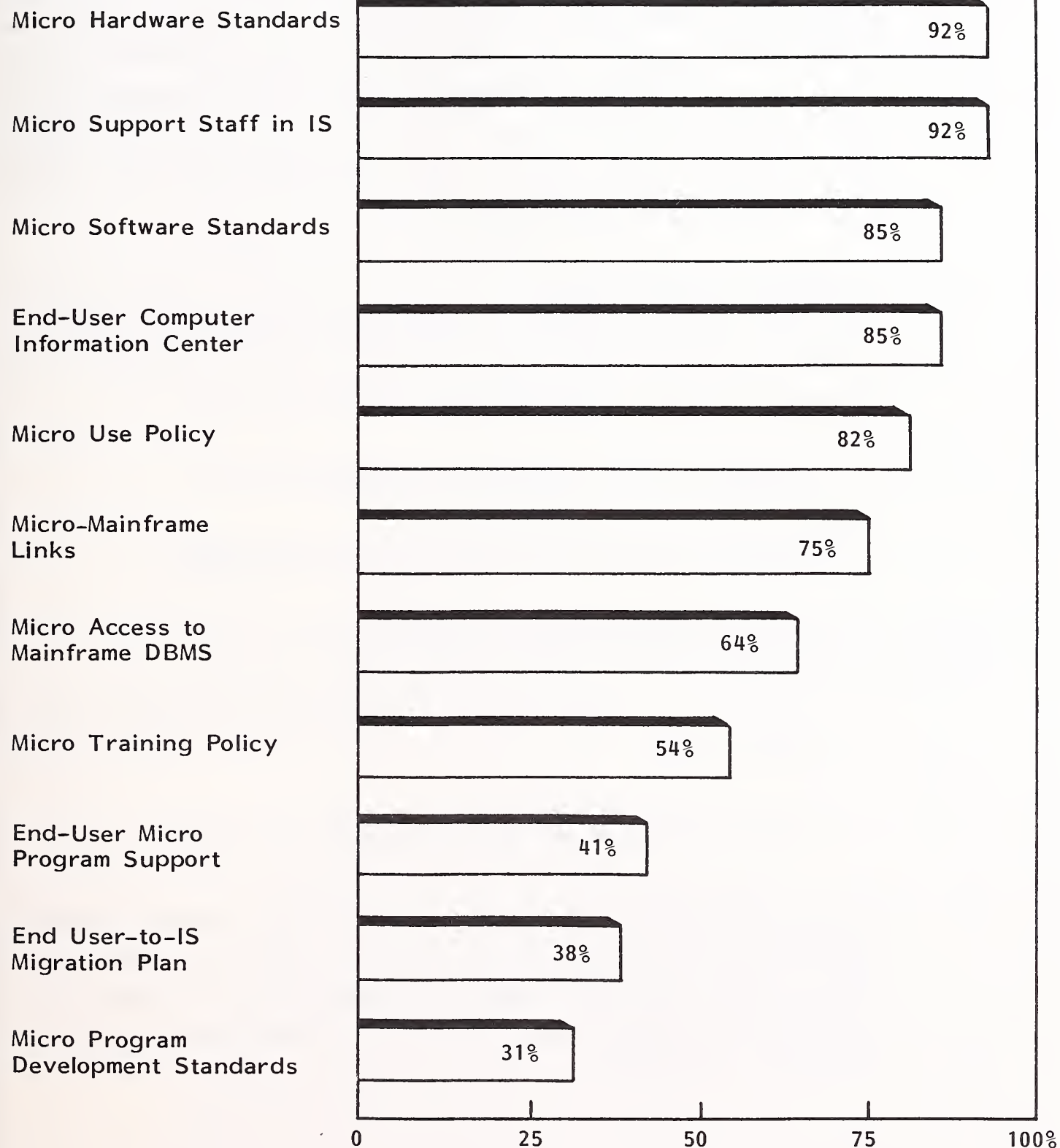
4. END-USER COMPUTING

- End-user computing can have a significant impact on PS market growth. Of the organizations surveyed, 92% report support programs in operation today, as shown in Exhibit III-8. Formal information centers are in operation at 85%

EXHIBIT III-8

END-USER COMPUTING SUPPORT ACTIVITIES

SUPPORT FOR END-USER COMPUTING



of these organizations and mainframe-to-micro links of some form are supported by 75% of these users. Staff members with experience in BASIC programming and spreadsheet design are in demand at 63% of these organizations.

- End-user computing is creating an end user computing base estimated by many sources to reach 20 million by 1990. Initially, this is a prime market for education and training. The result is a proliferation of micro-oriented training services. Custom spreadsheet design is becoming a viable business. When spreadsheet design is coupled with specific industry/application experience, the seller is able to charge a hefty premium for the service. Custom design of data bases is now emerging as an even bigger market.
- The biggest immediate potential for systems integration in the commercial sector lies in end-user computing. Linking micros to mainframes is essentially a systems integration task. This task generally includes selection of the following components.
 - Hardware--modems, emulators, interfaces.
 - Mainframe software--data base gateways, access monitors.
 - Micro software--data base, communications.
 - Custom development--data base setup, spreadsheet design, transfer files, macros.
 - User training--functional concepts, operating procedures.
- Few user organizations have many of the skills needed to support broadbased integration of micros and mainframe data bases. Most current implementations are either pilot/token efforts or were done by PS vendors. The accounting firms and the large management consulting firms have been the most active in this market.

5. ROLE OF I.S. AS A COMPETITIVE TOOL

- The role of information systems as both a strategic and tactical tool for achieving competitive advantages is rapidly increasing. This, in turn, is creating a critical time requirement to implement new systems. Often, these systems are also nationwide in scope. Here, then, we have together the two elements which most of the respondents feel greatly favor PS alternatives. Examples include systems to support such areas as:
 - Telemarketing.
 - Customer service response line.
 - Automated order entry.
 - Buyer and field support staff training.
 - Funds management.
 - Document delivery.
- The Federal Express ZAP mail is a classic example of the use of IS to create new markets and competitive advantages. Other examples of the use of IS in this manner are summarized in Exhibit III-9.

EXHIBIT III-9

USER EXAMPLES OF I.S. AS A COMPETITIVE TOOL

COMPANY	APPLICATION EXAMPLE
J.C. Penney	Credit card processing for major oil companies
Merrill Lynch	Cash management accounts with consolidated statements
American Hospital Supply	Distribution of 8,500 products to 100,000 health care facilities
American Airlines	Travel reservation services to 48% of 24,000 travel agencies in the U.S.
General Electric	Toll free hotline service for appliance repair - persons and customers
Aetna Life Insurance	AECCLAIM system for rapid clearing of health insurance claims
Citibank Corp and McGraw Hill	Commodity trading service and information data bank
Akzo (Dutchboy Paints)	Auto repair parts pricing and stock locator service for repair services
Red Lion Inn	Discounting rooms on-line to travel agent based on current occupancy data
USAA	On-line quotes and coverage options for independent insurance agents

D. USER SATISFACTION

I. VENDOR COMPETENCE

- Survey respondents are reluctant to single out specific vendors for either praise or blame. Praise can be used as an endorsement, blame may be a subject for debate. In either case, the specter of litigation hangs over a direct response. Respondents are much clearer in terms of categories of PS vendors. Exhibit III-10 illustrates user opinions of several sources for professional services.
- The software suppliers are favored by a significant margin, which is to be expected. Software vendor staff generally commands both application and industry expertise. Time and general cost factors favor these vendors. At the other end of the scale, user comments indicate that the "Big 8" accounting firms are viewed as least desirable. Reasons given are high cost and low level of experience among their analysts and programmers. These opinions correlate with the ratings of PS vendor selection criteria (see below), where auditors' recommendations rank last.
- Respondents were willing to name specific vendors for competence in training. The mainframe suppliers were named by 60% of these users as most competent. This, of course, is not surprising in the light of the dominance of mainframe-oriented training. Both Deltak and ASI also received repeated mention as competent suppliers.

2. PS VENDOR SELECTION CRITERIA

- Reputation is the primary criteria for selection of a PS firm, as shown in Exhibit III-11. This includes both prior work done for the user and the vendor's track record in general. A satisfied client is the best marketplace for future sales. Specific industry experience and staff qualifications also rate high on the users' list of selection criteria, ahead of price.

EXHIBIT III-10

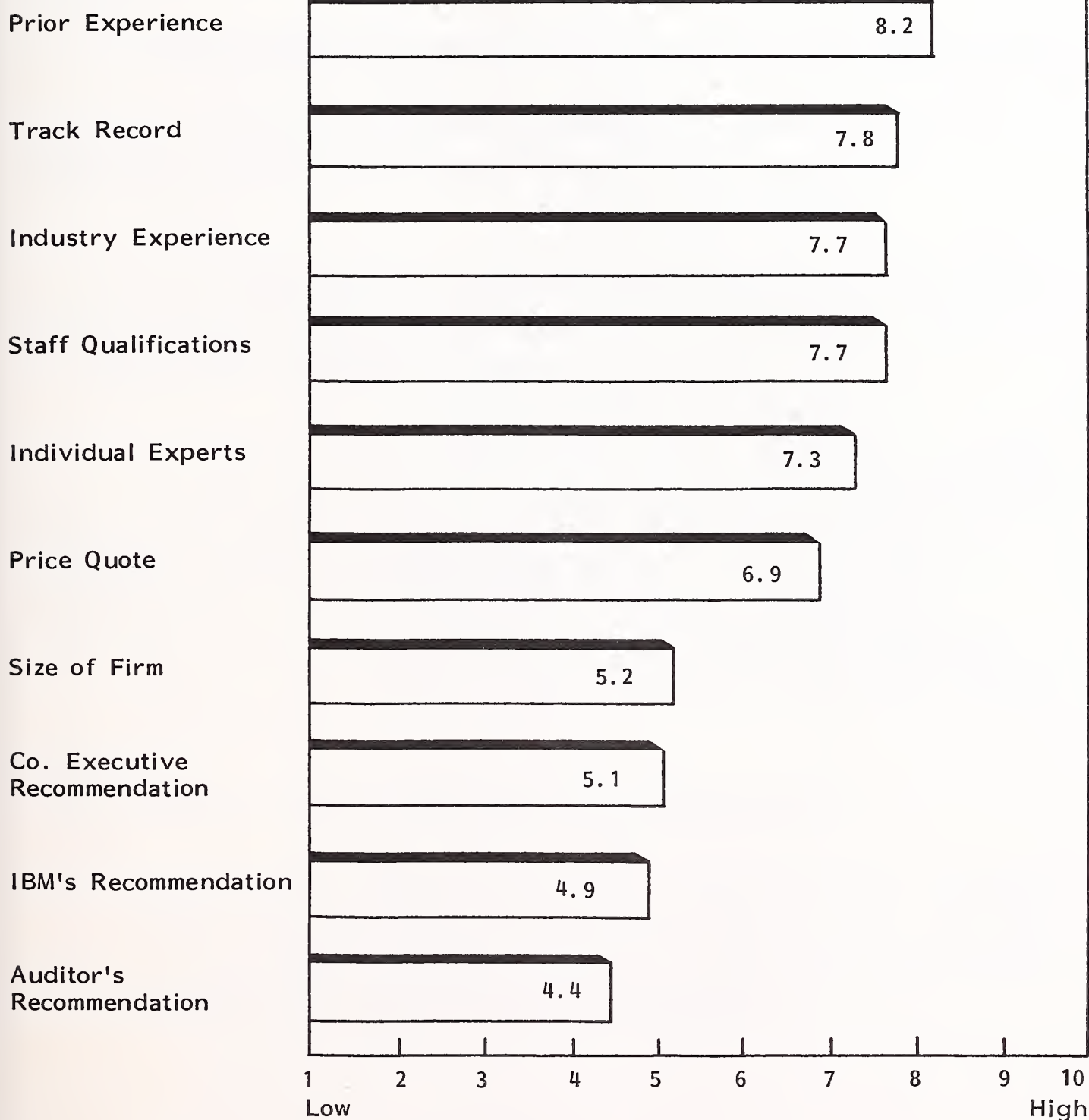
OPINION OF SOURCES FOR PROFESSIONAL SERVICES

SOURCES	RESPONDENTS (Percent)
Software Product Companies (MSA, Cullinet, UCCEL)	55%
Professional Services Companies (Computer Task Group, EDS)	30
Small, Local Management Consultants	25
Big, Nationwide Manage- ment Consultants (McKenzie)	18
Accounting Firms (Arthur Andersen, etc.)	13

EXHIBIT III-11

RESPONDENT RATING OF PROFESSIONAL SERVICES VENDOR SELECTION CRITERIA

FACTORS FOR SELECTING A PS VENDOR



- General references are not very significant in PS vendor selection. IBM's recommendation/reference counts almost as much as that from a corporate executive. As far as the IS group is concerned, a recommendation from the firm's external auditors pulls very little weight. The opinion that the PS activities of the "Big 8" accounting firms have an inside track with IS management is not substantiated by the results of this survey. However, corporate management may use accounting firms independently of IS.
- There are some caveats from respondents' comments worth noting:
 - Experience and qualifications--stability of the "local" PS staff is as important as its qualifications. This reflects a concern about changes in the PS team during the job.
 - Price--a willingness to "negotiate" between needs and costs is as important as the rate/price quoted. Working out a deal which gives the best mix of talents, vendor/user personnel, and assignments is important to the sophisticated buyer.
- PS staff qualifications are hard for buyers to evaluate. There are ". . .too many flakes" in the business, even in established PS firms. Buyers struggle with the problems of assessing depth of knowledge, quality of performance, and timeliness of delivery. Their fall-back position is to prior experience, track record, and references.

E. SKILLS AND SERVICES WANTED BY USERS

I. NEEDED BUT NOT AVAILABLE

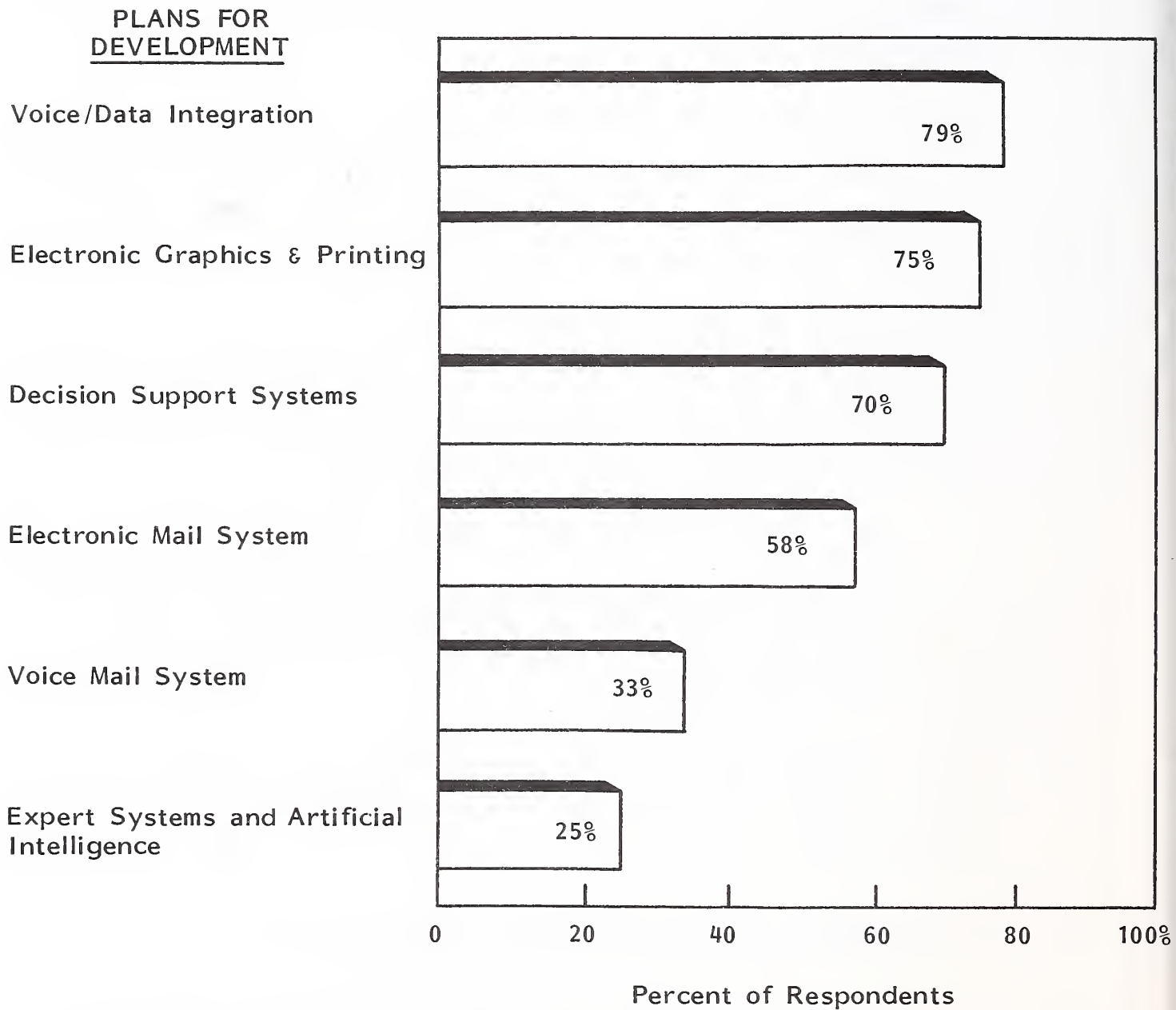
- Only one respondent in ten offered a recommendation. Their comments, however, are worth consideration. Services needed, but not readily available to these users, included:
 - Coordinate and moderate IS planning sessions. Bring in data which can help set long-range plans and act as the chairman of the planning session. Provide the structure for the session and the formats for recording the plans and recommendations.
 - Provide end-user documentation and/or guides for the program products or provide some source of automating its development from the standard product documentation. Too much time is needed to go from vendor documentation to end-user guides.
 - Provide training programs for in-house maintenance of terminals, workstations, and micros. Provide parts references and troubleshooting information comparable to that available for automotive products in a video or computer-based package.
- Each of these activities may be offered informally by one PS vendor or another. These respondents, however, are looking for more formal offerings in these areas.

2. SPECIAL APPLICATION/SYSTEM DEVELOPMENT PLANS

- Beyond specific business applications lies a realm of "base" or horizontal systems which extend the distribution of information services. The respondent were asked to speculate on their plans for such systems within the next 12 months. The results are illustrated in Exhibit III-12.

EXHIBIT III-12

PLANS FOR STATE-OF-TECHNOLOGY SYSTEMS DEVELOPMENT



- Integration of voice and data communications leads the list. This is a direct result of two circumstances.
 - Deregulation of the telecommunications industry with the attendant proliferation of services and changing service costs.
 - The increased use of information systems on a nationwide scale to support and create products.
- This need is also reflected in the search for network designers. Users feel that many dollars can be saved by careful design of an integrated telecommunications system. Long delays in establishing new services have also made these users vulnerable to their competition.
- The high ranking of electronic graphics and printing was unexpected. Both hardware and software are available to meet most needs. At \$3,300 per unit, the HP Laserjet provides local printing capability. The Xerox 8700 and 9700 provide both hardware and software for high speed.
- Implementation of decision support systems (DDS) is a prime example of integration of micros and mainframes. The mainframe provides access to the data base, the micro a processing point for the required analysis. Examples today include:
 - Merger and takeover analysis.
 - Analysis of service insurance service costs and profits.
 - Capital budget and return on investment analysis.
 - Loan characteristics analysis.

- Service call, response time, and cost analysis.
- Promotional price impact analysis.
- At the micro end, the work is done using Lotus 1-2-3, dBASE III, or PC FOCUS. At the mainframe end, users are relying on IDMS/R, RAMIS, NATURAL, and IDEAL to implement the data base gateways. Artificial intelligence and expert systems are seen as an extension to the DSS capabilities.

3. I.S. STAFF SKILLS NEEDED

- As shown in Exhibit III-13, there is a three-way tie in the critically needed staff skills among:
 - Telecommunications network designers.
 - Micro data base experts.
 - Micro end-user trainers (to support end-user computing).
- Only in the area of micro user training are PS firms considered the prime alternative to in-house capabilities, as shown in Exhibit III-14.
- In terms of other skills needed, only one other item is noted—the requirement for more business-oriented (i.e., less technology oriented) IS professionals. The IS establishment must change the nature of its staff if it is to remain in the mainstream of corporate information systems developments. This correlates with a Bureau of Labor Statistics report that shows an increase of 27% in systems analysts compared with a 1% increase in programmers in the U.S. over the next five years.

EXHIBIT III-13

RESPONDENT STAFF NEEDS FOR SPECIAL EXPERTISE

NEED FOR
STAFF IN I.S.

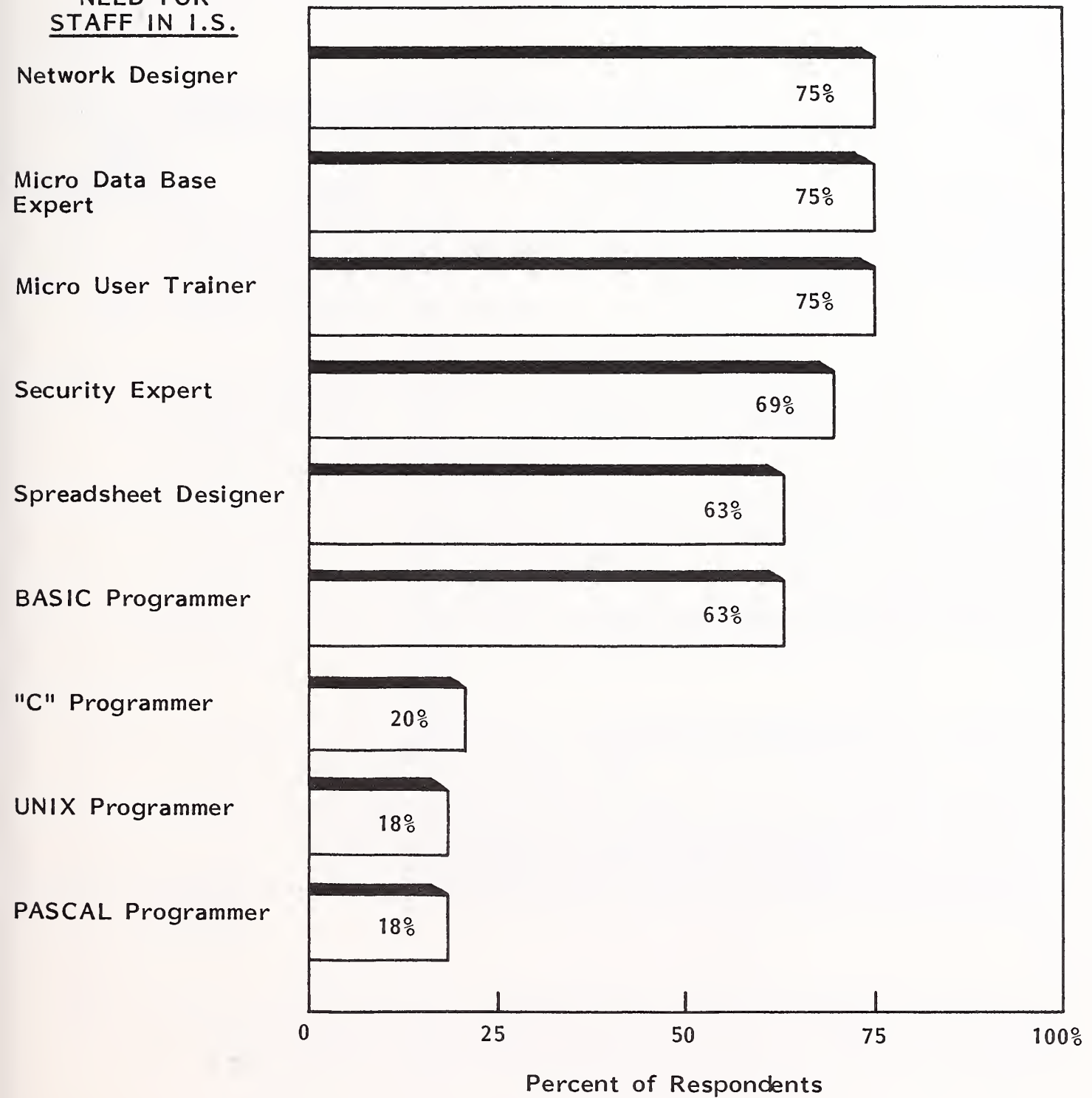


EXHIBIT III-14

COMPARISON OF USER NEEDS WITH SOURCES

RANK	REQUIREMENTS	NEED STAFF	USE EXTERNAL SOURCES
1	Network Design	75%	48%
2	Micro Data Base Design	75	35
3	Micro User Training	75	72
4	Data Security System	69	28
5	Spreadsheet Design	63	45
6	BASIC Programming (for Micros)	63	31

- Few respondents foresee a shortage of IS professionals that will impact their development plans. It is INPUT's opinion that IS organizations are underestimating their vulnerability to such shortages. This can work to the advantage of the PS firms in the next five years if they can corner the market for qualified network designers and security specialists. There is little hope, however, for having a monopoly on micro specialists.

F. GROWING OPPORTUNITIES FOR PS BUSINESS

- This section provides a general assessment of the opportunities for PS business in a number of high-growth areas. Exhibit III-15 summarizes user activity and opinions of PS vendors as sources.
- Telecommunications ranks at the top of the activity list. Most of these respondents (88%) already have responsibility for data communications. As has been stated, deregulation of the telecommunications industry in the U.S. will have a major impact on the need for new systems and services. For the respondents, the first step is to tackle the job of integrating voice and data services. Beyond this, a majority (58%) plan to implement electronic mail systems. Approximately one-half of these users plan to seek PS assistance in this effort.
- End-user computing is another high-growth area which could have a major impact on PS business. Under the control of the IS establishment, PS firms may play a lesser role. The key to this market is to sell at both end-user and IS levels. Training is being delegated to PS firms. A micro-mainframe system integration approach will favor the many skills that a micro vendor can bring into play.
- Advanced applications here include decision support, artificial intelligence, and expert systems. Today, users are focused on DSS. AI and expert systems

EXHIBIT III-15

ASSESSMENT OF PROFESSIONAL SERVICES OPPORTUNITIES

AREA	USERS WITH PLANS	PLAN TO USE EXTERNAL SOURCES
Telecommunication Systems	75%	48%
End-User Computing Services	75	35
Advanced Applications (Decision Support, AI)	70	45
Office Systems	70	20

are seen as the logical extensions, but not within the next few years. The industry leaders in both areas are the financial services companies and their associates, including the medical services industry and the health care management functions in larger corporations. A majority of these users plan to develop such systems in partnership with a PS firm.

- The focus in office system implementation has shifted from workstations to networking. This starts with integration of data and voice communications, includes electronic mail, and may lead to voice mail. Electronic document distribution is also a part of this picture. Most of the respondents (70%) now control development of office systems. A majority (58%) plan electronic mail implementations. PS firms, however, are only under consideration by 20% of these companies.
- Mainframe applications enter into the plans of virtually every one of these users. A majority (51%) plan to base their implementations on purchased software products. This, in turn, leads them to feel that their software vendors will be the major source for special programming.
- Conversions also enter into the picture. A new type of conversion effort, particularly within the banking industry, is emerging associated with mergers and acquisitions. PS firms have an opportunity for consulting, contract programming, and training.
- Ongoing maintenance and support services are still associated with hardware and operating system software. INPUT expects this to change as more users set up their own dedicated networks and as the numbers of workstations in these networks enters the thousands. In this environment, users will be looking for a single source of ongoing maintenance management to cover all components and suppliers. Nationwide PS firms will compete with the communications services companies for this business.

- Education and training will continue to shift from mainframe to end user computing. Users will continue to purchase most of their training services from PS firms. How much of this will be controlled by the IS group is uncertain. INPUT believes that IS will assume more control as the micro-mainframe links become stronger. Unsupervised learning on the micro is estimated to cost a company between \$5,000-7,500 per person. On-site instructor-based training can be purchased for \$300-600 per person for groups as small as five persons. IS is the only group in the company positioned to act as coordinator and purchasing agent for such services. Computer-based training (CBT) costs even less and can be shared among learners. IS is not yet doing enough to help its users in this respect. This, in itself, offers an ancillary PS opportunity.

G. CONTRACTING METHODS

I. CONTRACTING APPROACH

- Organizations surveyed have a strong preference for fixed-price contracts with PS firms. This is one of the few ways these users feel they can achieve acceptable levels of control. Control is the primary reason for not dealing with a PS firm. In this survey, the desire for fixed-price contracts varied from 95% for training services to 81% for consulting services. This is not a significant difference.
- The key to minimizing risk for both buyer and seller is to negotiate a compromise between fixed-price and time-and-material (T&M) type contracts. Users are more comfortable with short-term T&M contracts for small jobs and fixed-price contracts for the big jobs. For the PS firm, this leads to the following steps:

- Organize the project into high- and low-risk tasks.
 - Break the high-risk tasks into a number of small steps.
 - Negotiate with the buyer on a "share-the-risk" T&M basis for the high-risk steps or let the user do this work directly.
 - Offer fixed-price contracts to cover the low-risk tasks.
- The key key is to organize and negotiate around the buyer's feelings of discomfort.

2. FAIR COST/PRICE ESTIMATES

- The survey sample on this issue is quite small. Many users shy from providing an estimate of a "fair fee" for PS vendors. Around one-half of the respondents were, however, enticed into giving an opinion; the results are summarized in Exhibit III-16.
- These results are lower than many quotes. INPUT can only speculate as to whether this is the result of negotiation or the buyer's wish list prices. Cost is the second most important factor favoring in-house alternatives. When PS is an acceptable alternative, the price quote ranks only sixth on the list of selection criteria.

3. SINGLE VENDOR APPROACH

- The federal government has a long history of demanding single vendor, fixed-fee contracts. Both sides have benefited, current reports of misconduct being the exception. Now commercial sector buyers are starting to use the government's approach. In another survey of Fortune 1000 firms, almost one-half of the IS respondents expressed interest as follows:

EXHIBIT III-16

ESTIMATES OF "FAIR FEES" FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICE	FAIR COST AVERAGE \$/Hour	ESTIMATE RANGE \$/Hour	NUMBER OF RESPONDENTS
Consulting	\$76	\$30-200	16
Education and Training	54	20-100	22
Software Development	48	30-75	20
Systems Integration	38	30-50	7

- In favor of single vendor contracts, 15%.
- Would consider single vendor contracts, 33%.
- As more users install larger networks, the appeal of single vendor agreements will increase. There are just too many components from too many vendors to manage without setting up a very elaborate project control mechanism. Once the implementation is completed, this control mechanism becomes an unnecessary expense. This is why INPUT feels that the role of the PS systems integrator will become increasingly important in the commercial sector.

IV PROFESSIONAL SERVICES VENDOR VIEWPOINTS

IV PROFESSIONAL SERVICES VENDOR VIEWPOINTS

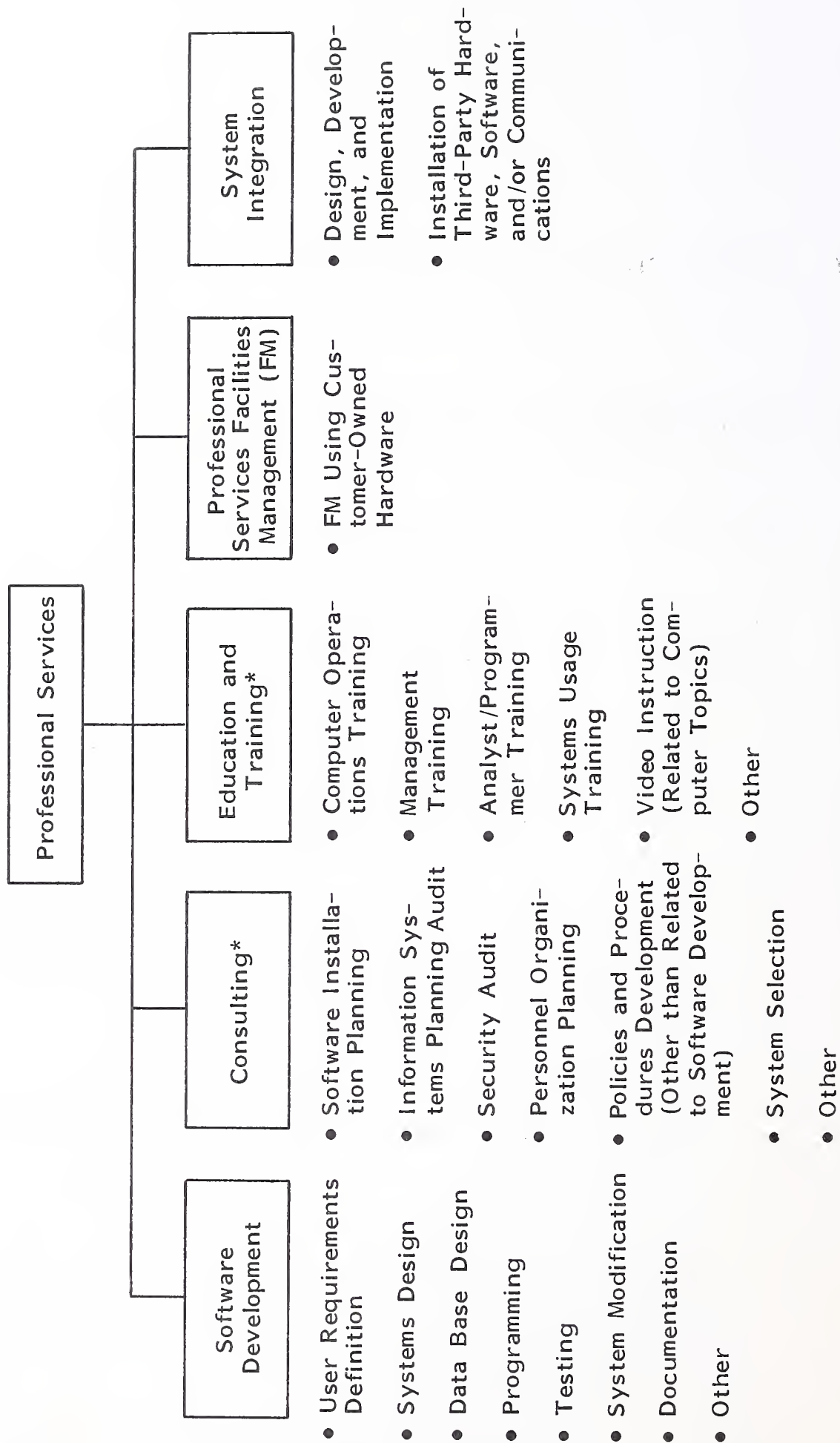
A. PROFESSIONAL SERVICES VENDOR CHARACTERISTICS

I. PROFESSIONAL SERVICES MARKET STRUCTURE

- As shown in Exhibit IV-1, the professional services market is made up of services in the following categories:
 - Consulting--information systems and/or services management consulting, project assistance (technical and management), feasibility analysis, and cost-effectiveness studies.
 - Education and training--products and/or services related to information systems for users, including computer-aided instruction (CAI), computer-based training (CBT), and purchased instruction for users in operations, programming, and maintenance.
 - Software development--system design, original programming, code conversion, benchmarking, independent verification, and validation of system performance.
 - Professional services facilities management--operation of user-owned information processing equipment on user-provided premises on a contract basis where the vendor provides staff to operate, maintain, and manage the user's facility.

EXHIBIT IV-1

PROFESSIONAL SERVICES MARKET STRUCTURE



* All related to computer systems, topics, or issues

- Systems integration--service which include system design, development, and installation and user staff training where the vendor is responsible as the prime contractor for the performance of all subcontractors.
- Each category of PS, in turn, is made up of a number of niches. Education and training, for example, has instructor-based services, CBT, CAI, and self-paced programs. While there are dominant vendors at the niche level, the overall PS market is very fragmented. The top 10 PS vendors account for only 21% of market share. Exhibit IV-2 identifies the top 25 PS vendors and their relative rank in each of the major PS market categories.

2. PS VENDOR SURVEY RESPONDENT CHARACTERISTICS

- Virtually every software and services supplier offers some type of PS and most of the system manufacturers are also in the PS market. Because of this, the survey research for this report included representatives from these other market sectors. Exhibit IV-3 summarized the characteristics of the 25 vendors interviewed for this report in terms of type and PS sales. These respondents accounted for an estimated \$2.63 billion in PS revenues (30% of the total) in 1984. The commitment to the PS business among these firms averages 57% of total sales and ranges from 10% to 100%.

3. PS BUSINESS DISTRIBUTION

- An average 51% of these respondents' PS revenues are from Fortune 500 customers and equivalent (i.e., revenues over \$400 million). For these firms, 26% of the PS business comes from public sector sources, primarily the federal government. The balance (23%) is generated from smaller customers. PS firms, along with many other sectors of the information processing industry, have yet to find an effective way to tap the potential in businesses under \$100 million in revenues.

EXHIBIT IV-2

TOP 25 COMMERCIAL PROFESSIONAL SERVICES VENDORS

COMPANY	VENDOR RANKING BY 1984 U.S. COMMERCIAL REVENUES					
	Overall Rank	Consulting	Software Development	Training	Facility Management	System Integration
*Arthur Andersen	1	8	1	1+	-	4
*Computer Sciences	2	6+	-	-	1	2
McGraw Hill	3	1	-	1+	-	-
IBM Corporation	4	2	5+	4+	-	-
*Computer Task Group	5	3+	2	-	4	-
Martin - MMDS	6	5	-	-	2	-
Digital Equipment	7	10	3	-	-	-
*GEISCO	8	9	5+	-	-	-
Burroughs/SDC	9	6+	9+	-	-	-
Peat Marwick	10+	-	7	-	6	-
Price Waterhouse	10+	-	8	-	-	-
*CAP Gemini DASD	12	-	4	-	-	-
DBA Systems	13	-	9+	-	-	-
*Informatics	14	-	-	-	-	-
*Analyst Int.	15+	-	-	-	-	-
*Elect. Data Systems	15+	-	-	4+	3	1
McDonnell Douglas ISG	15+	-	-	-	-	-
AGS Corp.	18+	-	-	-	-	-
*Computer Horizons	18+	-	-	-	-	-
*Science Applications	18+	-	-	-	-	-
*Control Data Co.	21	-	-	-	-	-
Amer. Mgmt. Sys.	22	-	-	-	-	-
Deltak	23	-	-	3	-	-
*Planning Research	24	-	-	-	-	-
A.D. Little	25	3+	-	-	-	3+

*Included in Vendor Survey

+Tied for ranking

EXHIBIT IV-3

PROFESSIONAL SERVICES VENDOR RESPONDENT CHARACTERISTICS

BY TYPE	RESPONDENTS
Independent Professional Services Firms	12
Subsidiary Operations	5
Software Suppliers	6
"Big 8" Accounting Firms	2
Total	25

BY SIZE OF PROFESSIONAL SERVICES SALES	RESPONDENTS
> \$100 Million	6
\$51-100 Million	6
\$11-50 Million	7
< \$10 Million	6
Total	25

BY PERCENTAGE OF PROFESSIONAL SERVICES SALES	RESPONDENTS
76% - 100%	9
26% - 75%	9
25% or Less	7
Total	25

- The average distribution of PS revenues by service and type of customer base is summarized in Exhibit IV-4. Very little PS business in facilities management (FM) or systems integration (SI) comes from the commercial sector. As a result, most of these respondents had little to share with INPUT regarding viewpoints on these two service areas. The focus of respondent viewpoints in this section of this report, therefore, is on consulting, software development, and IS education and training. Systems integration is the subject of a special INPUT report and facilities management is covered in the INPUT report Federal Government Professional Services Markets.

B. NEW/GROWTH OPPORTUNITIES

I. SIGNIFICANT IMPACTS ON PS BUSINESS

- Most PS vendors (88%) believe that the shortage of IS technical professionals will have a significant impact on their business, as shown in Exhibit IV-5. These respondents believe this impact will be, on balance, favorable. The consensus is that a shortage of IS professionals will be felt most directly by IS groups. PS firms, on the other hand, should be in a better position to attract and retain the most talented and experienced professionals. PS vendors feel that IS groups will be hard pressed to meet either the professional or compensation expectations of these people.
- The state of the economy is also considered to have a significant impact on the PS business by most respondents (80%). This impact is felt on an industry-by-industry basis. Within a specific industry sector, PS spending tracks economic ups and downs. The only two exceptions today appear to be banking and the federal government.

EXHIBIT IV-4

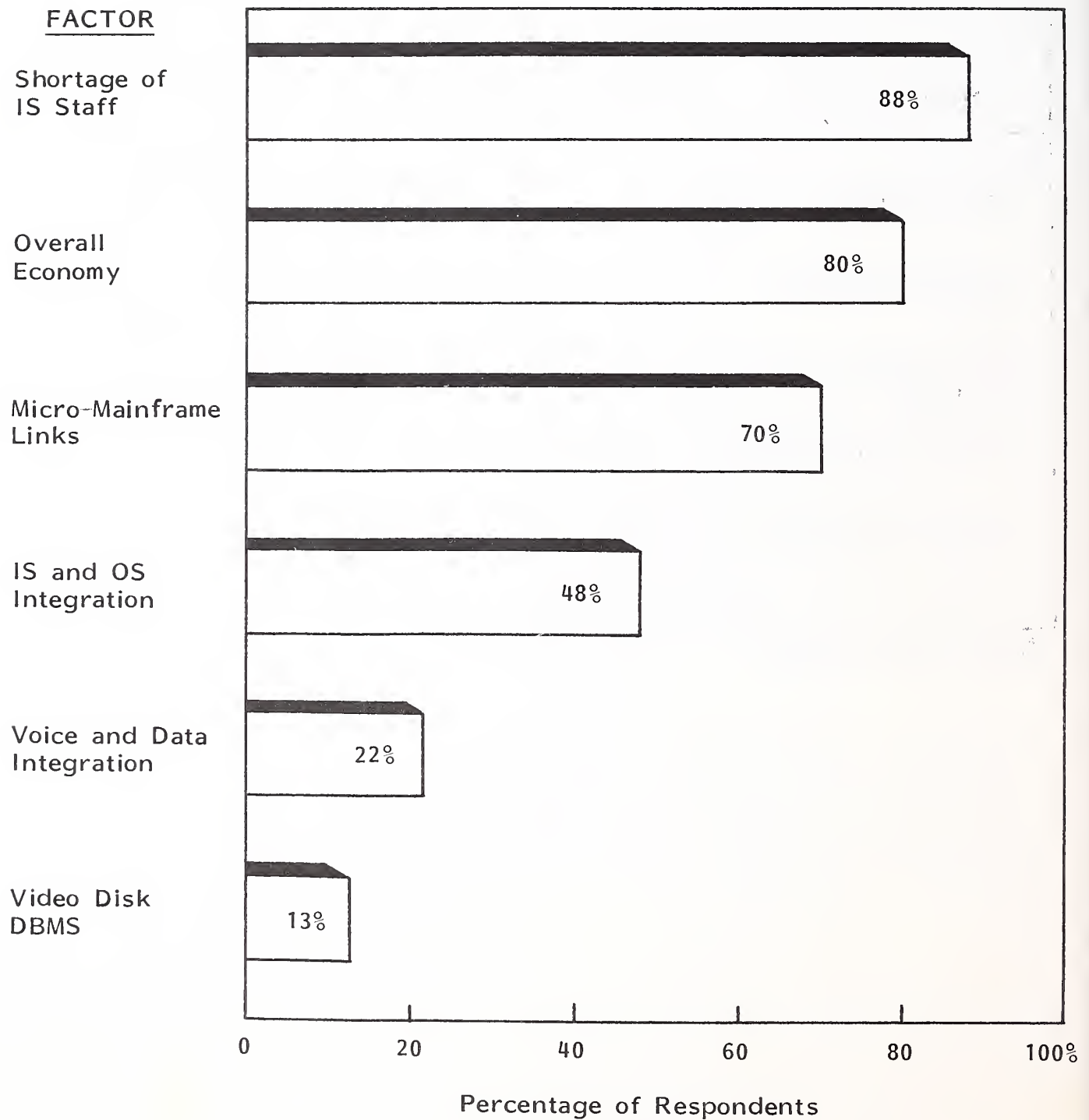
PROFESSIONAL SERVICES BUSINESS DISTRIBUTION FOR SURVEY RESPONDENTS

SERVICE TYPE	SOURCE OF PROFESSIONAL SERVICES REVENUES BY SERVICE			
	Fortune 500 (> \$400 M)	Medium and Small Firms	Government / Public	Not Offered**
IS Consulting	52%	20%	28%	-
Software Development	52	16	26	6
IS Education and Training	48	16	25	11
Facilities Management	3	-	17	80
Systems Integration	13	9	25	53

**Not in this business

EXHIBIT IV-5

FACTORS WITH SIGNIFICANT IMPACT ON
PROFESSIONAL SERVICES MARKETS



- Banking is an exception due to deregulation and a resultant rash of mergers.
 - The federal government is an exception because of the sorry state of federal ADP and its inability to support delivery of vital services (i.e., IRS, FAA, Social Security, FHLB).
- In other industry sectors, however, a downturn in sales or earnings often translates into a cutback in IS spending for professional services.
 - The micro-mainframe link is considered to have a significant impact on PS business by 70% of the respondents. Mainframe suppliers of data base management systems are in the best position to take advantage of this situation. This link often requires additional efforts in requirements analysis, custom development implementation planning, security, and end-user training. DBMS suppliers like Cullinet and Cincom Systems offer products for both ends of the link and are themselves linking up with application/industry experts to offer turnkey implementations.
 - Respondent vendors believe that integration of voice and data communications will become more important in the three- to five-year timeframe. A significant impact by video disk-based DBMS is not expected to occur within the next five years. Other areas with significant impacts suggested by these vendors include:
 - Systems integration for the commercial sector.
 - Lower cost and higher performance computer systems.

- Also receiving mentions were:
 - Fourth generation programming languages from IBM.
 - More use of sophisticated relational DBMS.
 - Extension of CAD/CAM beyond engineering into DSS.
 - More use of CBT for IS staff training.
- Systems integration is seen as a strategic approach for large increases in PS revenues. The opinion of a number of respondents is that many IS groups are hard pressed to undertake large-scale implementation projects, particularly when they include telecommunications and special purpose systems. Activities in both the federal and state government markets are allowing PS vendors to develop the staff and contract management infrastructure to take on such projects for the commercial sector on a fixed-price basis. Since IS management cannot offer as much certainty for internal implementations, the PS alternative becomes much more attractive.
- Significant improvements in hardware price/performance have been an ongoing trend for 30 years. There is no reason that this trend should not continue, particularly for:
 - Microcomputers and workstations based on Intel 80286 and 80386 microprocessor technology.
 - Data storage devices based on optical disk and compact disk technologies adapted to workstation environments.
 - Local area networks and their supporting technologies which will allow cost-effective sharing of sophisticated image processing subsystems.

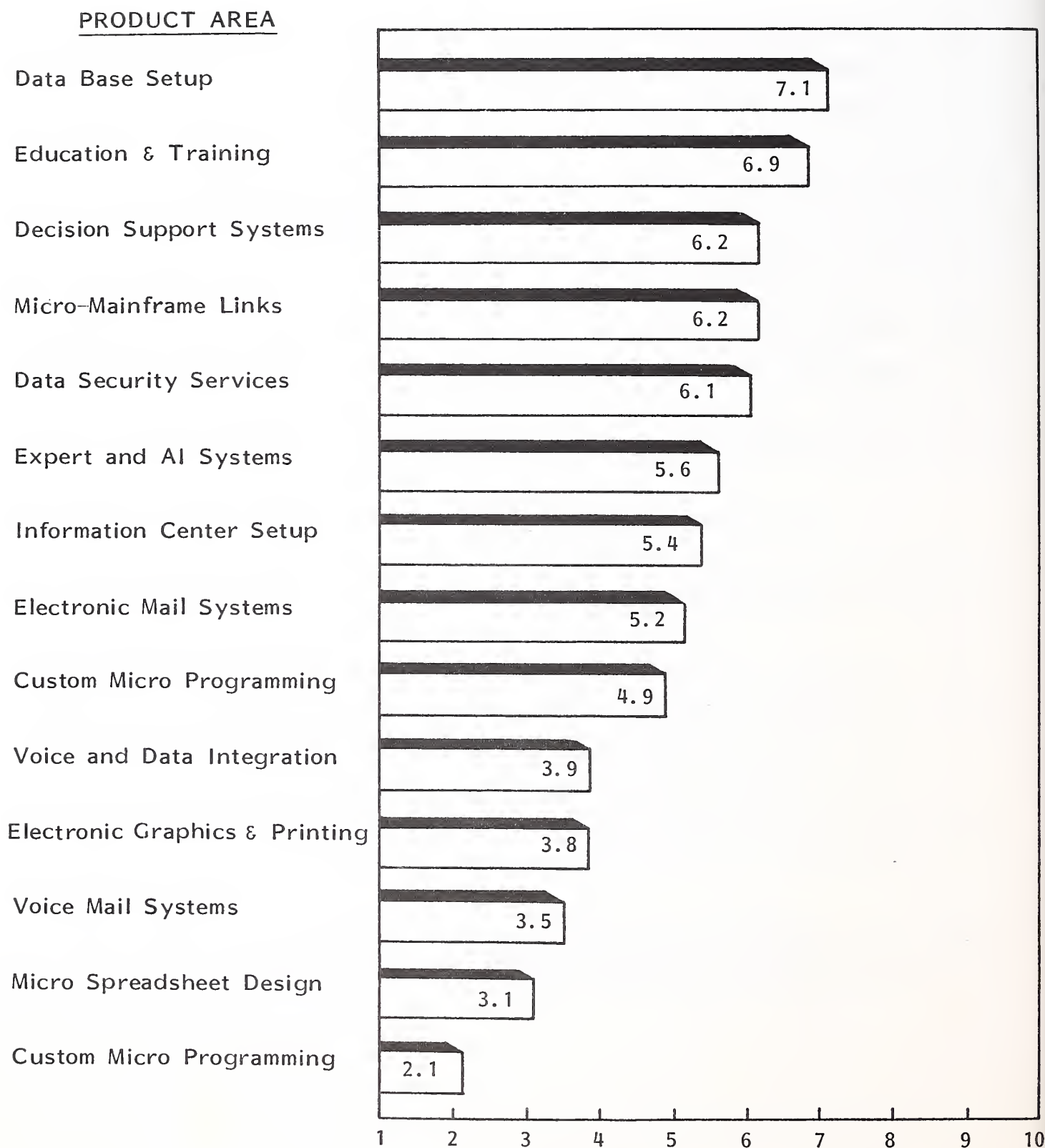
- The most significant impact of these technologies is expected to be on the input, output, and distribution of information in an electronic rather than paper-based form.

2. RATINGS OF PS BUSINESS OPPORTUNITIES

- The PS firms surveyed for this report were asked to rate 14 specific product areas in terms of importance to their PS business in the next one to two years, as shown in Exhibit IV-6. The top-rated opportunities are:
 - Data base setup, including installation and structuring.
 - IS education and training in general.
- Another way to look at these potential PS opportunities is by related groups, as follows:
 - Telecommunications-oriented services.
 - Micro-oriented services.
 - Systems integration-oriented areas.
- Electronic mail and voice mail system implementations both require the same set of skills. Integration of voice and data communications requires a skill set that supports mail system implementation efforts. Electronic mail implementation is rated as only an average opportunity over the next two years. Voice and data integration is expected to increase in potential in the next three to five years.
- Micro and end-user computing-oriented services require similar skill sets. The rankings and average ratings of opportunities in this area are:

EXHIBIT IV-6

RATING OF PRODUCT AREAS FOR PROFESSIONAL SERVICES BUSINESS OPPORTUNITIES



- Micro-mainframe links (average at 6.2).
- End-user computing information center setup (average at 5.4).
- Custom microcomputer program development (marginal at 4.9).
- Each area taken alone has only average or marginal interest for the respondent vendors. Taken together, however, these services compliment and support each other.
- Other areas of opportunity suggested by respondents included.
 - Inter-enterprise system/application development such as what General Motors and EDS is working on with auto component manufacturers and what AT&T Communications is working on with banks and grocery stores for funds transfer.
 - Programmer productivity tool development which can be integrated with consulting, system analysis, and IS training.
 - Extension of IS training to include business concepts and functional procedures in an integrated presentation. Examples include investment management, loan application processing, financial planning, and health claims processing.

3. NEW SKILLS REQUIRED

- As shown in Exhibit IV-7, most PS firms interviewed (95%) see the key to remaining competitive as developing their professional staff. This is followed closely by a need to develop proprietary products which can carry PS activities to higher profit margins.

EXHIBIT IV-7

REQUIRED SKILLS FOR SUCCESS IN PROFESSIONAL SERVICES MARKETS

RANK	NEW SKILLS	PERCENT OF RESPONDENTS
1	Industry and Application Experts	95%
2	Software Integration	91
3	Computer Based Training (for Clients)	83
4	Ongoing Maintenance	80
5	New Programming Languages (Fourth Generation)	67

- A study of the skills seen as necessary leads to the hypothesis that a general strategy of vertical integration is being implemented. The scenario of activities in this strategy includes:
 - Gain a critical mass of industry/application experts on staff.
 - Integrate PS activities with the in-house development of proprietary software to expand the set of offerings.
 - Develop supporting CBT packages for both clients and staff which integrate IS and functional training.
 - Extend the business relationship with the customer over a longer time period by offering ongoing support services.
 - Keep at the state-of-the-art level by further developing staff skills in the use of fourth generation languages.
 - Enhance staff productivity and reduce turnover by developing and using automated design, program, and document tools.
- These steps are then applied to specific vertical applications and industry markets. Examples of this strategy include Hogan Systems in banking, Arthur Andersen for grocery and discrete manufacturing, and EDS in health claims processing.

4. WORKING RELATIONSHIPS

- Most respondents (95%) report that teaming is the most common and effective means of expanding their business. The federal government again provided a starting point for developing such working arrangements. Examples include:

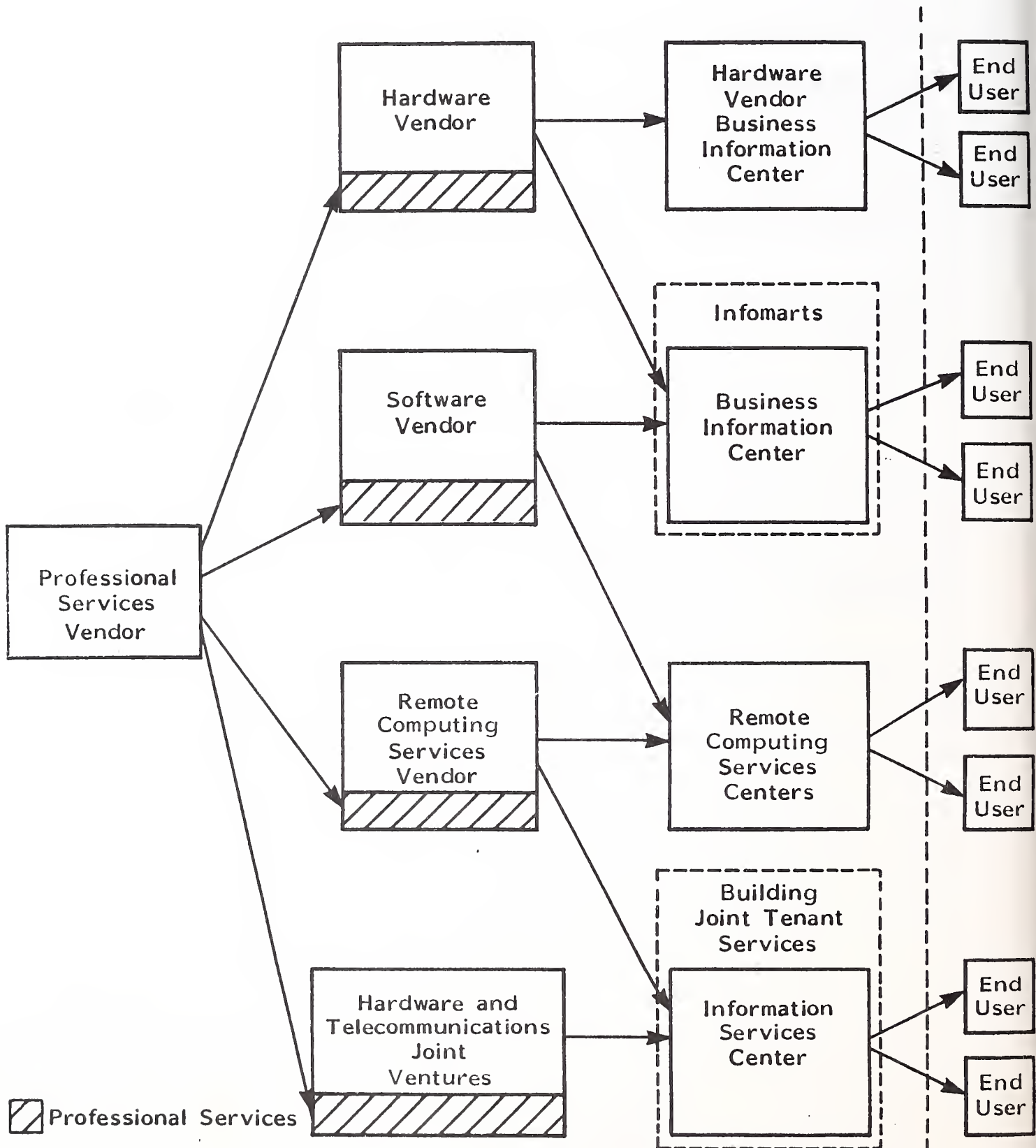
- EDS and GTE Telenet with network system integration for the FAA.
- Arthur Andersen & Company and MSA with integrated inventory and accounting for the USMC.
- Cullinet and Sysorex with manufacturing control for the U.S. Mint.
- These working relationships are now being extended to the commercial sector. Types of working relationships reported by respondents included:
 - Marketing and teaming agreements, 95%.
 - Licensing agreements, 50%.
 - Joint ventures and formal "partnerships," 44%.
 - Acquisitions, 36%.
- Most respondents consider the details behind such relations as very proprietary. Some, however, openly promote the relationships; a few examples of marketing agreement and teaming relationships are summarized in Exhibit IV-8. These agreements concern only very specific industry and application niches where both parties are significantly stronger together.
- The marketing agreements in PS follow the pattern of OEM agreements among small systems vendors. Exhibit IV-9 illustrates the flow of PS business through distribution channels developed by marketing agreements. AT&T and the Regional Bell Operating Companies (RBOCs) are eagerly pursuing marketing agreements with many PS firms which have specific industry orientations.

EXHIBIT IV-8

EXAMPLES OF PROFESSIONAL SERVICES MARKETING AGREEMENTS

PARTICIPANTS	PROJECTS AND MARKETS
Arthur Andersen Company and MSA	Materials and financial applications for food marketing industry
Arthur Andersen and Company and CAP Gemini	Computer system conversion projects
EDS and GTE Telenet	Systems integration for packet networks
ATT/IS and Aries Group	Network design and analysis
Cullinet and Computer Horizons	Data base conversion projects
Cullinet and Rand Info.	Data base conversion projects

PROFESSIONAL SERVICES DISTRIBUTION CHANNELS



- Licensing is used many ways. Examples include:
 - MSA licenses Arthur Andersen & Company for implementation, modification, and ongoing support for the food marketing industry.
 - Arthur Andersen & Company licenses applications for distribution to industry from a number of other companies and offers single-point support.
 - Computer Sciences Corporation, as an example, offers 12 different types of licensing agreements depending on its role as either prime or subcontractor.
- Mergers and acquisitions will continue to occur. The most likely targets for acquisition are those firms which support the vertical integration strategy of software product firms. PS firms could be more successful by acquiring software and processing services firms since there are specific tangible products to deliver. Going the other way, the acquisition needs to be friendly or the key management and staff melt away to other organizations, leaving a hollow shell of past performance.
- Many new startups are expected, focusing on such areas as telecommunications, end-user computing services, decision support and AI implementation, and data security services. Because of this, domination of the PS market by a few big companies is not expected within the next five years.

5. INVESTMENTS FOR PS BUSINESS SUCCESS

- Respondents were told to assume they had a windfall of \$2 million to invest in the future of their PS business. They were then asked how they would invest these funds. Eighteen (72%) of those surveyed replied. Based on this subset of 18, the results are:

- Fund development of proprietary productivity tools to be used internally, 61%.
- Expand by acquisition (geographic and services), 39%.
- Fund research and development of artificial intelligence products for specific industry applications, 28%.
- Other areas noted for investment included a new telecommunications network to support sales efforts and delivery of staff services with less travel, computer-based tools for bidding and management of fixed-price contracts, installation of "test beds" for staff training such as IBM System 36, and arrays of LAN-connected micros and peripherals.
- When it comes to investment in professional staff, these firms are looking for specific expertise in the following areas.
 - Telecommunications.
 - Cost, schedule, and contract management.
 - Fourth generation languages such as FOCUS and NATURAL.
- In general, however, many firms are looking to upgrade their professional staff from programmers to applications and system analysts with a solid knowledge of the business functions which are being computerized.

C. MARKET DEVELOPMENT

1. PS MARKET SELECTION

- Many PS vendors will actually pick their PS markets, but some other considerations lead the way today. Nineteen respondents were able to comment on market selection issues. Of these, 60% rely primarily on referrals from other products and services. A few respondents (21%) report no corporate plan at all, leaving the issue to each local office.
- The results in this survey lead to the conclusion that PS market selection is a passive, not an active, task among most firms. PS markets are defined by outside factors such as proprietary software development or historical relationships in specific industries. PS market selection for these respondents is opportunistic rather than deterministic.

2. PS PROSPECT SELECTION

- For most respondents (60%), prospect selection comes from referrals based on other sales. Only 26% report an active campaign through direct mail, telemarketing, or prospect profiling. Use of such "horizontal" sales approaches are favored for training and software products. For consulting and programming, however, prospecting outside of the established client base is not a formal activity.

3. PS BUSINESS PROMOTION

- PS marketing is based on tie-in sales with other products and services, referrals from product sales units, networking within the current client base, or very specific application/industry niches. It is no surprise that 60% of the respondents rely on direct contact calls to promote their business. This also includes attending conferences, giving presentations, sitting on panels, and expanding the network of contacts within special-interest areas.

- One-third report using direct mail as a promotional method, but only a quarter use it for prospecting as well. Very few (15%) report using trade journal advertising to promote the PS part of their business.
- One promotional technique catching on for PS firms is the use of newsletters. These newsletters focus on specific technical, application, or industry subjects. They combine updates on new developments, case studies, and promotional pitches. Examples include:
 - Trends and analysis of telecommunications tariffs by The Aries Group.
 - Updates and case studies in computer-based project management by McDonnell Douglas ISG.
 - The state of applications development for the food marketing industry by Arthur Andersen.
 - Tips on tax law and data processing from several "Big 8" accounting firms.
- These newsletters offer both useful information and sales pitches. IBM set a pattern with its Viewpoint magazine for system users. The whole idea is to give the buyer something new and important to think about, while at the same time providing a feeling that this new approach has been done successfully before by the authors.

D. PS BUSINESS DEVELOPMENT

I. PROFIT MARGINS IN THE PS BUSINESS

- Profit margins on PS business vary greatly depending upon whether the PS effort is supported by software sales. The difference in PS profit margins is:
 - Incremental to software sales, 25-35%.
 - Without tie-in to other products or services, 10-15%.
- None of the respondents were able to differentiate profit margins between consulting, programming, or systems integration. They did, however, have different estimates for commercial and federal business. These results are:
 - Commercial sector, average of 18% with a range of 6-60%.
 - Federal government, average of 13% with a range of 8-15%.
- The highest profit margins belong to packaged training products and PS business directly tied to customizing software products.

2. IMPROVING PS PROFIT MARGINS

- The message is clear--the surest way of improving PS profit margins in the commercial sector is to tie them in with sales of proprietary software. One way to do this is by acquisition. Another approach is investment in development of proprietary software. Areas that look promising include productivity tools for IS, decision support and AI for financial analysis, and data security management.

- Other ways suggested by respondents to improve profit margins include:
 - Cost control through investment in computer-based project and contract management.
 - Greater development of niche markets, offering more services and getting more mileage out of the client base.
 - Use of telecommunications to move work to staff instead of staff travel or local staff expansion.
- Examples of computer-based cost control include the Boeing Proposal Pricing System, AGS' PAC III, and MSCS and COPES from McDonnell Douglas ISG. These are mainframe tools priced in the \$80,000 range with a sizeable investment in staff learning. Oracle offers Total Control for the VAX at \$40,000. There are some micro-based packages in the \$2,000 range, but they do not yet offer multi-user access.
- More development of the existing customer base requires overcoming the following barriers:
 - IS development resistance to PS alternatives.
 - Acquisition and development of the technical staff.
- A term used for overcoming these barriers is "rollability." This means "rolling" the current client from one job or service to the next. The most successful consulting companies have done this for a long time. This can also mean "rolling" a staff member from one expertise to another to increase their value to both client and firm.
- Raising prices and rates to increase profit margins seems unlikely. Respondents consider current rates "about as high as they can go. . ." and report

billing rates in the range of \$50/hour for a documentation and training specialist to \$150/hour for a senior technology expert. The trend will be from "T&M" to fixed-price contracts.

- Rates as such are not the only issue. The main issue is buyer concern for loss of control and the risk of open-ended commitments. The strategy is to hold rates, hire experts, and increase productivity and billing time by investing in computer- and communications-based tools.

**V PROFESSIONAL SERVICES MARKET ANALYSIS
AND FORECASTS**

V PROFESSIONAL SERVICES MARKET ANALYSIS AND FORECASTS

A. MARKET FORECAST

I. TOTAL MARKET FORECAST

- Professional services' growth rate in 1984, at 20%, was slightly ahead of the rate of growth of the information services industry, at 18%. Total professional service sales in the United States, including the federal government, reached \$10.52 billion in 1985.
- The outlook in PS for the next five years is an annual average growth rate of 21%. The forecast for all professional services sales in 1990 is \$26.32 billion, as shown in Exhibit V-1.
- Software development continues to account for almost 60% of the market. Exhibit V-2 shows the distribution of this market by type of service for 1985 and 1990. Over the next five years, the fastest growing segment will be systems integration services at 25% per year. (Note: Commercial systems integration detail will be provided in INPUT's forthcoming report on this rapidly emerging market.)
- The distribution of the market by industry sector is summarized in Exhibit V-3. The telecommunications industry will offer the highest growth rate for professional services over the next five years. This is due to deregulation and

EXHIBIT V-1

TOTAL PROFESSIONAL SERVICES MARKET, 1985-1990

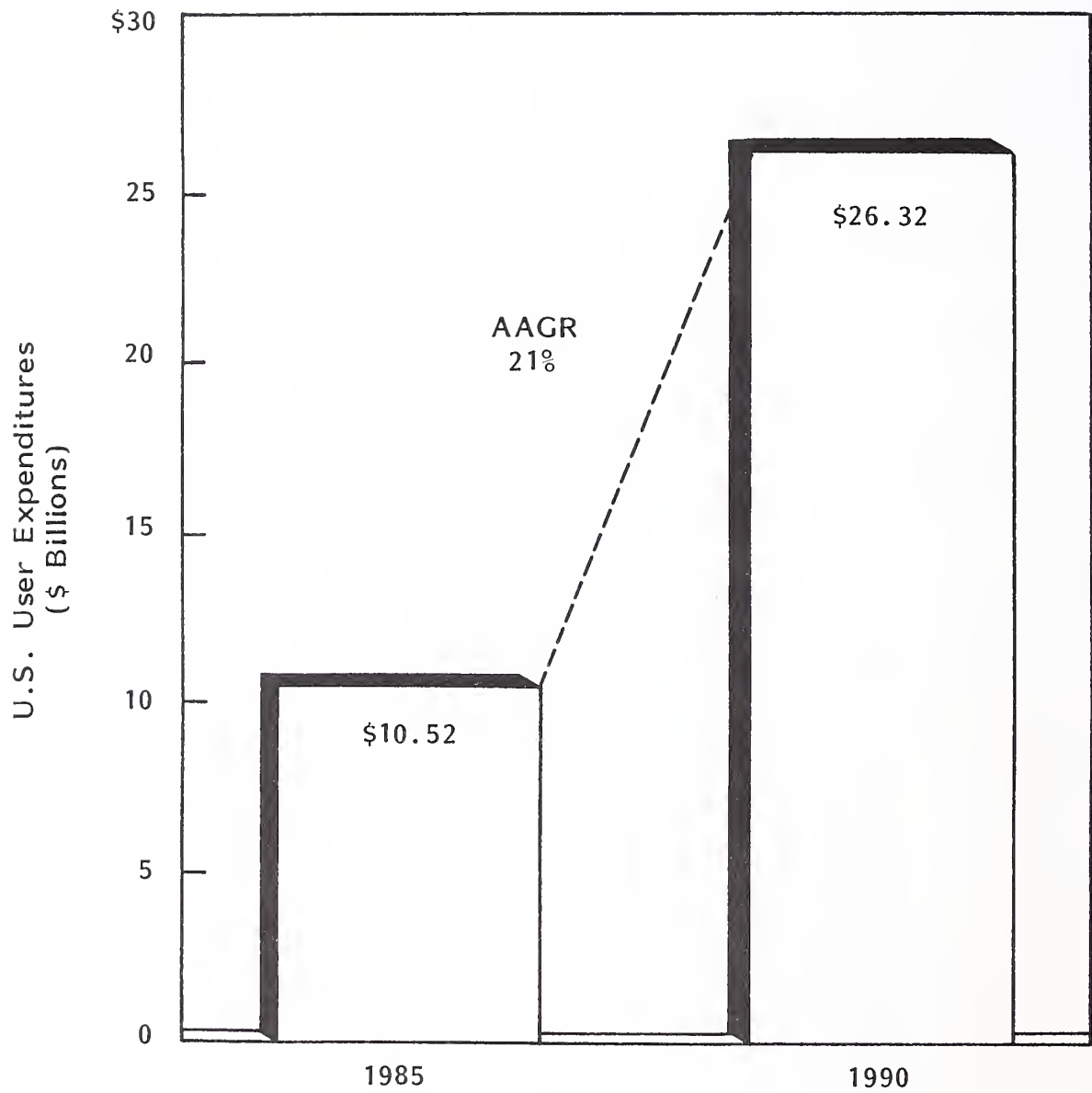
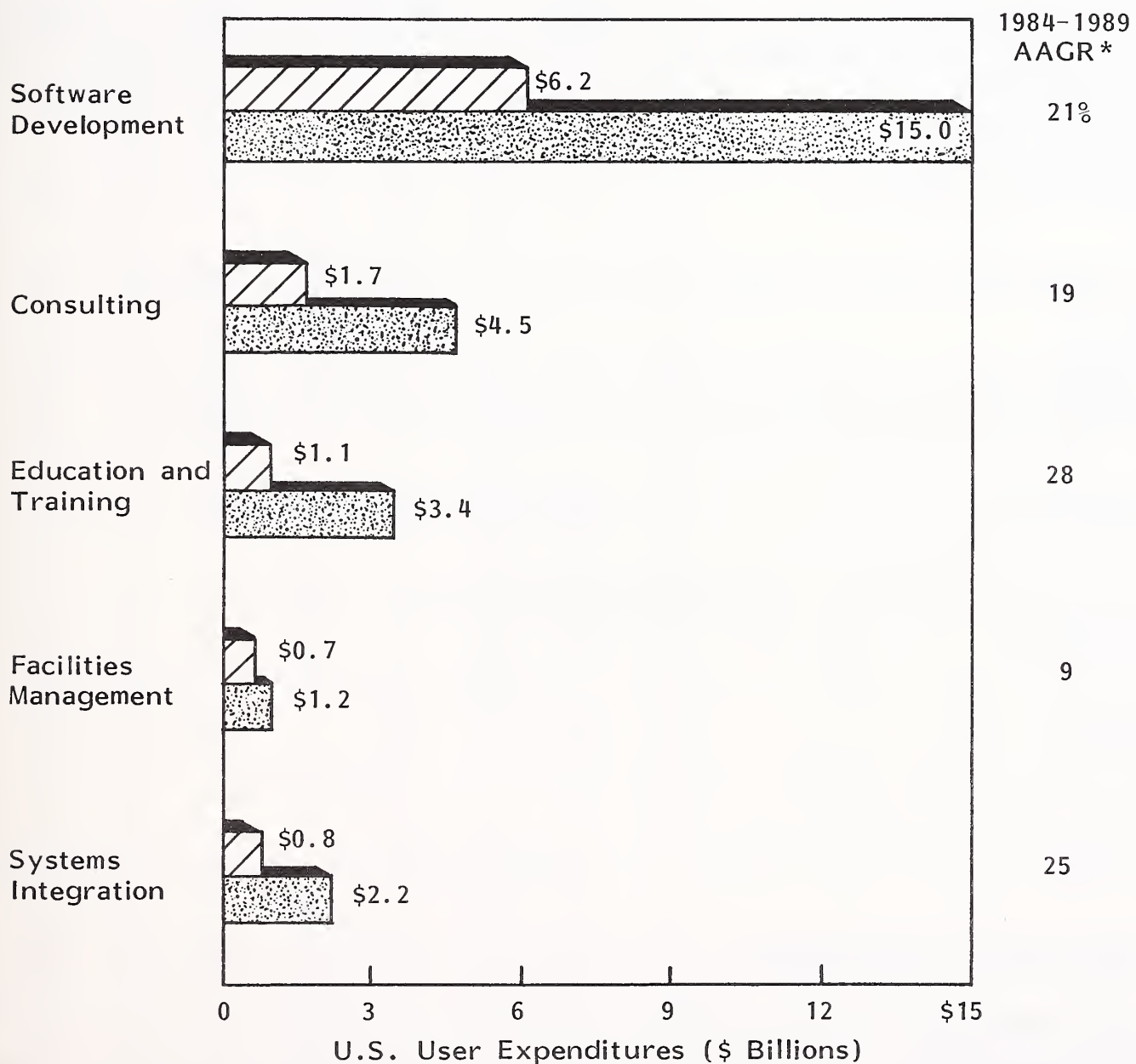




EXHIBIT V-2

TOTAL PROFESSIONAL SERVICES MARKET BY SERVICE TYPE, 1985-1990



1985		\$10.52	AAGR* 21%
1990		\$26.32	

* AAGR = Average Annual Growth Rate

EXHIBIT V-3

PROFESSIONAL SERVICES MARKETS BY INDUSTRY SECTOR, 1985-1990

INDUSTRY SECTOR	PROFESSIONAL SERVICES MARKETS			
	1985 (\$ Millions)	Change 1984-1986 (Percent)	1990 (\$ Millions)	AAGR (Percent)
Discrete Manufacturing	\$1,681	20%	\$4,579	22%
Process Manufacturing	791	10	2,101	22
Transportation	137	12	305	17
Utilities	67	10	103	9
Telecommunications	305	25	968	26
Distribution	486	14	1,064	17
Banking and Finance	1,254	21	3,500	23
Insurance	706	16	1,757	20
Medical	220	20	598	22
Education	65	7	101	9
Services	140	15	302	17
State and Local Government	1,121	15	2,608	18
Other Industries	210	15	485	10
Commercial Total	\$7,183	18%	\$18,471	21%
Federal Government	3,343	21	7,845	17
Total	\$10,526	19%	\$26,3116	20%

resulting instabilities in service pricing and market development. Manufacturing is also forecasted to offer better than average growth potential. The driving force here is foreign competition, leading to a push for factory automation and reductions in administrative overhead. Medical services will also be a leader due to the shift in population demographics.

2. COMMERCIAL PS MARKET FORECAST

- The commercial segment of professional services is \$7.2 billion and accounts for 68% of the total market in 1985. This segment is expected to grow at a rate of 21% per year, reaching almost \$19 billion by 1990, as shown in Exhibit V-4. The distribution of this market by type of service is shown in Exhibit V-5.

3. VENDOR VIEWPOINTS ON SHORT-TERM MARKET GROWTH

- The INPUT survey respondents offer their own opinions concerning market growth for professional services in 1986. These estimates are:
 - From the vendors, 23% overall.
 - From the commercial IS management, 8%.
- The INPUT forecast for 1986 is:
 - Overall, 20%.
 - Commercial market, 19%.
- One balancing factor is that there will be more non-IS buyers of professional services, particularly in the areas of consulting, training, telecommunications, and micro-oriented projects. Another balancing factor is that there will be more professionals used to handle changes in both financial services and

EXHIBIT V-4

COMMERCIAL PROFESSIONAL SERVICES MARKET, 1985-1990

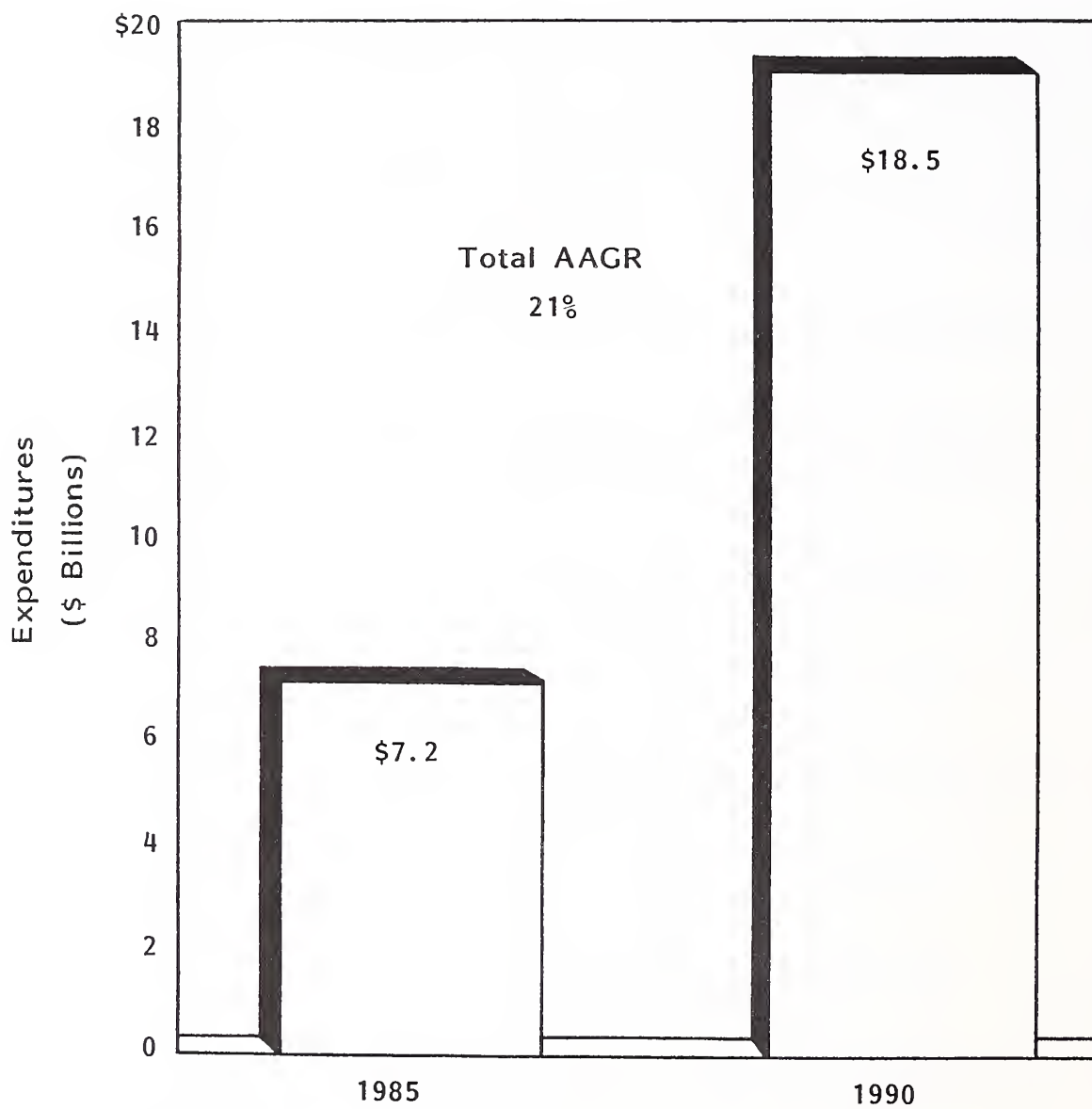
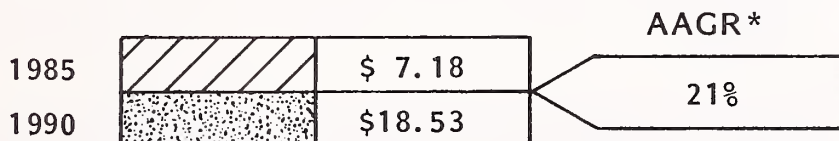
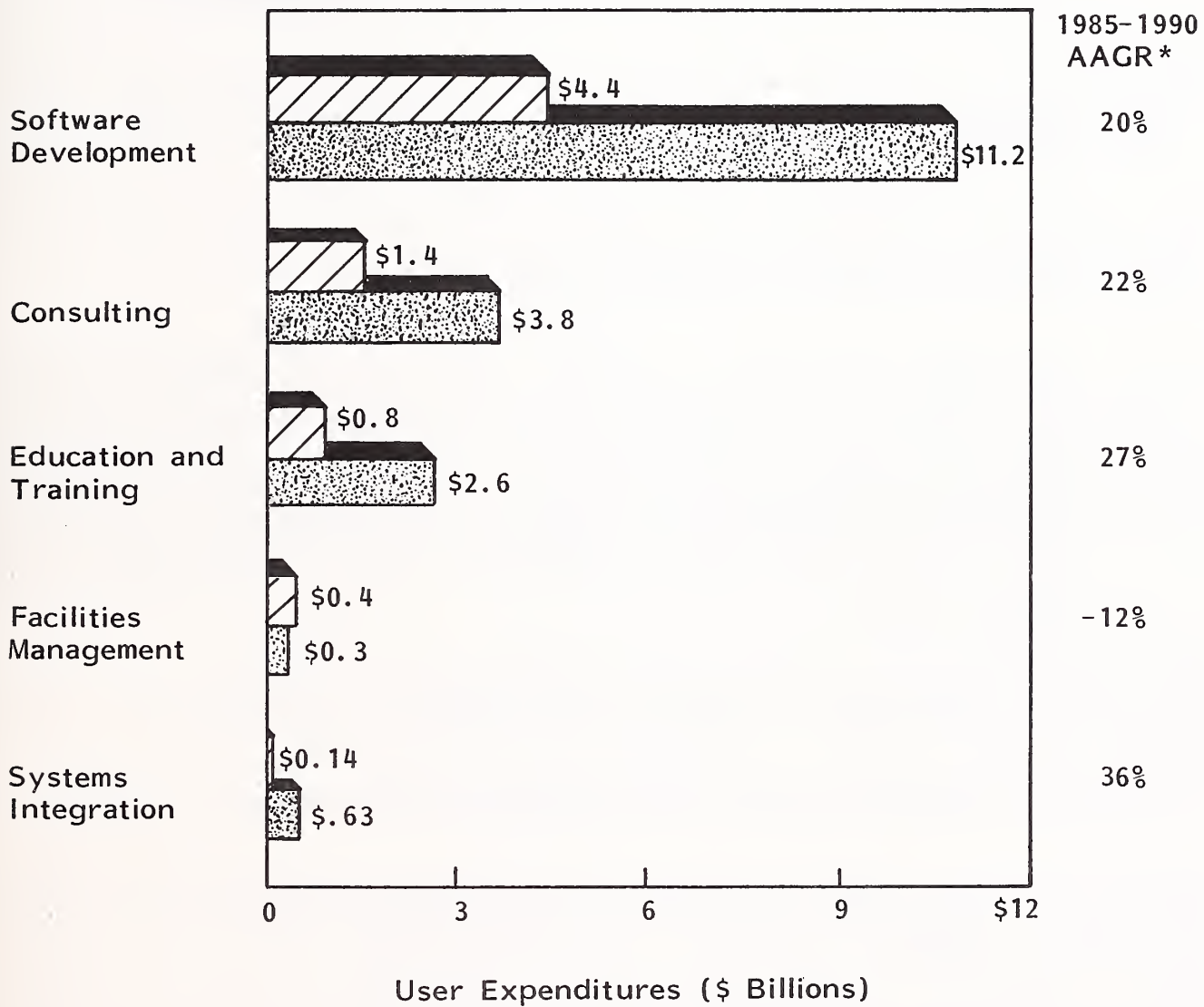


EXHIBIT V-5

COMMERCIAL SERVICES MARKET BY SERVICE TYPE, 1985-1990



*Average Annual Growth Rate

telecommunications industries due to the impact of deregulation. IS management is not taking such issues into consideration in their estimates.

- The customer base for professional services will also expand in 1986. System manufacturers in general, IBM in particular, AT&T, and the Regional Bell Operating Companies (RBOCs) are all creating new distribution channels for professional services. This is not yet apparent to IS management.

B. TRENDS IN PROFESSIONAL SERVICES MARKETS

I. IMPACT OF THE FEDERAL GOVERNMENT

- The federal government is relatively sophisticated in shopping for its PS needs. Much of the development of the infrastructure in the PS market has been funded through federal procurements. (With exception of education and training, every other PS market area is leveraged off of the federal business base.) Federal procurements are leading PS vendors to place emphasis in the following areas:
 - Providing more ongoing post-implementation support services.
 - Offering complete systems integration under fixed-price contracts.
 - Teaming with other PS firms to offer quicker implementation at lower costs.
 - Using more formal and structured design and development methodologies.
 - Offering subsystem approaches which are linked by packet data networks.

- The federal government is making effective use of consultants and PS firms to develop high-quality specifications. Development plans often include the development of pilot systems for evaluation and acceptance prior to full implementation. This, in turn, is making the bidding and contracting process much less risky for both parties. These techniques are equally applicable to doing business in the commercial sector.

- The federal government is funding major R&D projects in system integration. These are:
 - Multibase--prototype software to provide a uniform interface to data bases on other systems. Computer Corporation of America is the project manager for DARPA.

 - Integrated Information Support System (IISS)--software for control of access and sharing of preexisting data bases. Boeing Computer Services and Control Data are conducting the research for the U.S. Air Force.

 - Integrated Design Support System--project for the use of off-the-shelf hardware and software for management of supply logistics among many manufacturers of aircraft components. The project is being conducted by Rockwell and Computer Corporation of America for the Air Force.

 - Integrated Manufacturing Distributed Data Base Administration System--prototype software to update and retrieve information from existing data bases and computer systems. Research is being conducted by the University of Florida for the National Bureau of Standards.

- While most of these R&D efforts are defense logistics oriented, they do point the way to systems integrations of the future for manufacturing and distribu-

tion. The PS firms working on these projects are building an experience base for such business.

2. CONSULTING SERVICES

- There is a proliferation of IS consulting businesses. Over 2,000 companies and 7,000 independents are listed in the J. Dick & Company's comprehensive directory. There are regional gluts of small consulting business in such areas as Washington (DC), Dallas, Boston (and Route 128), and the San Francisco Bay Area. Technical professionals are "going independent" and reselling services to their former IS employers. This trend has caused the State of California to consider legislation that would classify such independents as "employees" for tax purposes.
- Consulting associated with telecommunications is starting to build rapidly, although from a small base. Many services formerly provided through the "Bell System" are now being tuned over to a cadre of consultants and PS firms working on a referral basis through AT&T Communications and the RBOCs.
- IS management uses consultants to save time and avoid mistakes. The buyer's problem is that here are too many alternatives and too many "experts" who only look good on paper. Buyers are struggling with how to gauge consultants:
 - Depth of knowledge.
 - Quality of performance.
- These buyers do not want to trade off internal staff trial-and-error for trial-and-error from a consultant.
- This concern favors established PS firms over the local independents. Referrals, references, and prior experience track records all help the buyer make the decision faster and the commitment larger.

- Prototyping is becoming an attractive approach as a means of moving from analysis of needs to a working system. This approach is very successful in federal system procurements. It reduces risks for both buyer and seller when detailed specifications are difficult to document.
- Software development in the U.S. is estimated to be at a level of \$20 billion per year. Perhaps 15% of this total (\$3 billion) is wasted on applications that never go into operation. An additional \$2 billion is estimated to be lost due to ineffectiveness of the application to do the job. Effective use of IS consultation at the beginning of a project can eliminate such losses. The message for PS firms in this segment of the business is that IS management can offset the costs by avoiding the potential losses.

3. SOFTWARE DEVELOPMENT

- Some parts of this segment, notably software development, are fast becoming commodity businesses. There is a new source in the marketplace, the "talent" brokers. Providing COBOL, IBM JCL, and systems programmers is fast becoming an adjunct of the professional search and temporary services businesses. Because of this, there is increasing instability in billing rates. While temporary service agencies do try to control rates, the professional search and services brokers merely arbitrate what an independent "consultant" is willing to take and what an IS department is willing to pay. For these sellers, the business is strictly incremental and they are willing to take small fees.
- Outside of the federal government sector, the only way to ensure decent profit margins is to develop business in the following areas:
 - Application/industry business in areas such as security, telecommunications, and planning.

- Product-associated customization such as what Hogan Systems does for banking.
 - Multiapplication integration such as what Arthur Andersen & Company does for grocery stores.
 - Through referrals from established product suppliers such as IBM, AT&T, and Cullinet.
- There is a significant benefit in specialization. This approach creates an experience base for consulting, training, and ongoing support. The problem with this strategy may be that the size of the potential customer base is relatively small and saturation is possible in just a few years.
 - The largest and fastest growing of these markets is in banking services (banks and thrifts). This market is estimated at \$1.25 billion in 1985, increasing to \$3.5 billion by 1990 at a 23% per year rate. The factors driving this market are deregulation, competition, and consolidation. These factors put pressure on IS departments to offer new services in very short timeframes.
 - Many PS firms are looking for some way to "productize" the software development business. One approach taken by Arthur Andersen & Company is to integrate services with the sale of its "Programmer's Workbench" productivity tool. McDonnell Douglas ISG offers Stradis and now PC Stradis, integrating consulting and training with a system development methodology.

4. PROFESSIONAL SERVICES FACILITIES MANAGEMENT (FM)

- To date, facilities management in the commercial sector has been very small compared with the government sector. The focus has been on data center operations, and most commercial firms do not want to turn over their data centers to outsiders. There are, however, new types of FM contracts being signed for operation of special function systems.

- A recent example is the contract between EDS and General Foods for FM operations of an on-line order processing network and center. EDS is also making a bid to provide FM for the management of dedicated data communications systems supplied by GTE Telenet. EDS manages the implementation of the network based on Telenet equipment and AT&T circuits, then provides ongoing operation of the network control center and coordinates maintenance of the many network components and services.
- In the area of telecommunications systems FM becomes an incremental offering to systems implementation and integration.

5. SYSTEMS INTEGRATION (SI)

- Systems integration in the commercial sector could become the fastest growing segment of PS business. Measuring SI revenues is difficult because it includes design, project management, custom software development, user training, and mark-up on third-party hardware, software, and communications.
- On-line systems account for most of the functional SI business. This includes:
 - Telecommunications system operations, monitoring, and management.
 - Data entry and retrieval subsystems for customer services (ordering and maintenance).
- SI firms have the following advantages over product companies:
 - Lower profit margins, in the 10-15% range.
 - No R&D efforts to support.
 - Lower G&A and overhead rates.
 - Economies of specialization in both sales and support.

- Cullinet is pushing into the business to offset slowdown in mainframe software sales. Cullinet is signing up applications specialists to act as either team members or prime contractors backed by its own DBMS specialists.
- Mainframe manufacturers are not willing to produce integrated DBMS and data communications systems. This leaves the door wide open for SI to implement micro-mainframe links.
- Turnkey network implementation is another big growth opportunity for SI. There are an estimated 12,000-18,000 private networks in operation in the U.S. They are now increasing at a rate of 20% a year since divestiture and deregulation. AT&T Long Lines used to handle all the problems in one way or another, but this is no longer possible. AT&T now finds itself in competition with its RBOC family for the business, which includes:
 - Network design.
 - Component evaluation.
 - Implementation management.
 - Problem diagnosis (ongoing).
 - Service quality monitoring (ongoing).
 - Network optimization (ongoing).
 - Vendor service coordination (ongoing).
 - Vendor contract management (ongoing).
- These functions can be readily combined with network FM to increase the value of a contract and provide a recurring revenue base after implementation.

6. EDUCATION AND TRAINING

- Based on a survey of American industry by Training Magazine, 1984 spending is estimated as follows:
 - \$1.353 billion for seminars, conferences, and on-site and off-site instructor-based training.
 - \$.737 billion for off-the-shelf training materials, including computer courseware, video/audio tapes, books, and films.
- The IS segment of this market is estimated by INPUT at \$.80 billion (38%). This segment is expected to grow at a rate of 27% per year to \$2.60 billion in 1990. The fastest growing part of IS training is computer-based training (CBT).
- A 1985 study of Fortune 500 training professionals provided the following results.
 - Sixty-two percent offered some type of CBT.
 - Twenty-five percent allocated at least 20% of their budgets for CBT.
 - Twenty-two percent allocated between 10-20% of their budgets for CBT.
- There is good data to support the benefits of CBT over conventional instructor-based training. One study was conducted by the University of Florida on the training of caseworkers for the Aid to Dependent Children program. The results of this study showed:

- Faster learning by 25% (120 hours for CBT versus 160 hours for conventional).
 - More qualifications by 20% (60% of CBT class qualified versus 50% for conventional).
-
- CBT is becoming a significant part of the operational training programs in American industry (Exhibit V-6 summarizes a few examples). CBT is more acceptable to executives, senior management, and the in-field work force. It can be used at home during non-prime work hours and at a self-paced rate. Scoring the program can be kept confidential with only a "pass" record published after mastery of the subject.
 - CBT is expensive to develop. First, good CBT programs require a dedicated group of experienced professionals. CBT is definitely not for well-meaning amateurs. Second, CBT takes time. It takes from 30 to 40 hours of programming to create one hour of instruction. For a six-hour course, that could be six weeks of programming. Once completed, however, changes can be made in a very small fraction of the development time. This is important for equipment maintenance training (trucks, autos, jet engines, office, and computer equipment) where engineering and part changes are a continual occurrence.
 - The oldest form of CBT is Control Data's PLATO system. PLATO was initially funded by a National Science Foundation grant to the University of Illinois in 1964. Control Data has used PLATO to provide training programs for manufacturing, health care, finance, and energy utilities. Since the pioneer days of PLATO on the CDC Cyber Systems, CBT has evolved to the micro as its base system.
 - Micros and video cassettes provide the basic delivery vehicles for CBT today. Video disks, however, will replace VCRs in the next generation of CBT products. Advantages of video disks over VCRs include:

EXHIBIT V-6

CURRENT EXAMPLES OF COMPUTER-BASED TRAINING (CBT)

COMPANY	PROGRAM
Ford Motor Company	Dealer mechanic training and parts inquiry retrieval.
Sizzler Steak House	Customer order taking.
J. C. Penney Co.	In-store inventory control and stock management techniques.
AT&T Communications	Field service technician training and diagnostics inquiry/retrieval.
Charles Schwab Co.	Financial information retrieval techniques integrated with fact retrieval.
American Airlines	In-flight attendant, service mechanic, reservation clerk, and pilot training.
State of Florida	Aid to Dependant Children caseworker training.

- Individual "pathing" through course material based on user ability.
 - Faster response (one second) to help and reference commands.
 - Greater storage capacity (54,000 pages per disk side).
- VCR-based systems are basically "page turners" while video disk systems can be interactive and responsive to individual learning patterns. More experience, however, is needed for video disk-based CBT. Cost estimates for producing one hour of interactive video disk instruction typically range from \$5,000 to \$20,000, depending on the technical nature of the subject and the degree of "looping" and student feedback provided. GE reports spending \$3,500 per hour of instruction on jet engine maintenance.
 - Leaders in CBT authoring systems today are identified in Exhibit V-7. These systems provide the tools for writing CBT courseware, including graphics, screen design, branching and looping logic, testing and scoring, and student recordkeeping. CBT tool building is a segment of the software product market.
 - The next step in the CBT product chain is interactive courseware. This is included as part of the PS market for IS training. Tutorials for micro-computer applications fall into this category and micro user training is the most easily identifiable segment of the CBT market. There are two somewhat different approaches to micro-oriented CBT, as follows:
 - "Situation" learning which uses simulations to test the user's ability to find the right solution.
 - "Interactive" learning which uses a question/answer technique to test user learning.

EXHIBIT V-7

LEADING VENDORS OF AUTHORING SYSTEMS

AUTHORING SYSTEM	VENDOR
<u>MICROCOMPUTER-BASED</u>	
Authority	Interactive Training Systems
Ghostwriter	Cavri Systems
Interact	Ashton, Inc.
Professional Authoring System	Bell and Howell
Video Courseware Development	Bell and Howell
Electronic Authoring	Edutronics Division, McGraw Hill
PC Phoenix	Goal System International
<u>MAINFRAME-BASED</u>	
Interactive Instructional Systems	IBM
Phoenix	Goal Systems International
PLATO	Control Data Corporation
Scholar/Teach 3	Boeing Computer Services

- "Situation" learning is not applicable to maintenance and customer service situations. "Interactive" learning is good for knowledge worker training in service organizations and administrative functions (accounting, personnel, and legal groups). The leaders in both micro- and mainframe-based CBT are identified in Exhibit V-8.
- QED Information Sciences specializes in "situation" learning products. Deltak and Edutronics specialize in "interactive" learning products. Control Data uses both techniques in its 90-hour CBT program on the ADA language (fundamentals, advanced features, and software development techniques) for CD programmers and contractors.
- Micro user training per se is the most rapidly growing segment of the market. Estimates are that this segment alone will reach \$620 million by 1990 from \$138 million in 1985, an increase of 33% over 1984 spending. This includes both instructor-based services and CBT products. In terms of potential customer base, the micro training base at 6 million today is the largest by a factor of 10 and is expected to increase by a factor of five by 1990. The battle for this market is between the following alternatives:
 - Instructor-based, computer-assisted training.
 - Computer-based training (CBT).
- Instructor-based micro training is preferred by end user and IS organizations and is a budgeted item in 90% of the Fortune firms. If students get lost or stuck, the instructor is there to intervene. Courses can be readily tailored to specific industries and applications. Operational and technical training can be combined. On the average, less than 15% of a typical technical training budget today is allocated to CBT, even though it offers the following advantages.

EXHIBIT V-8

LEADING VENDORS OF COURSEWARE

Microcomputer-Based

Cdex Corp.

Knoware

American Training International

Micro Mentor

Mainframe-Based

Crwth Computer Courseware

Control Data Corporation

Boeing Computer Services

Multimedia Training

Advanced Systems, Inc.

Deltak (Subsidiary of Prentice-Hall)

Interactive Training Systems

Learning International

Edutronics (McGraw Hill)

- Lower cost per student hour.
 - Flexible schedule and home study.
 - No travel.
 - Self-paced.
 - Consistent quality.
 - Automatic review.
 - Reusable.
- CBT overcomes many of the barriers for executive training such as loss of prime work time and ego-threatening experiences.
 - The keys to the growth of CBT include:
 - User friendliness of the courseware.
 - Initial cost of the complete system including video disk.
 - Costs of keeping the courseware up to date.
 - Some combination of instructor-based and CBT will emerge. The split will then depend upon the scale of training to be delivered and the market will be divided into standard, custom, and semi-custom programs. CBT will dominate the standard segment and instructor-based programs will be most cost-effective for the custom situations.
 - The instructor-based micro training market is highly fragmented. Manufacturers, dealers, consultants, dedicated storefront training firms, universities,

extensions, and community colleges all offer services. Many of these offerings are of poor or marginal quality.

- Like "hamburger joints," instructor-based micro training is ripe for franchising. One example of this is Puter Tutor Computing Learning Center in Houston (TX). Puter Tutor offers a franchise for a \$10,000 fee, plus 12% of gross (8% royalty plus 4% advertising) for a 20-year license. A Puter Tutor franchise operation is designed for a location of 1,700-2,000 square feet in a shopping center with classes ranging in size from 4-10 students/course. Each student has a "learning station" which includes an IBM PC, color monitor, printer, and VCR.
- Businessland has also moved aggressively into micro user training on a national basis. A headquarters group develops the programs and training materials for the individual stores to use. The instructors may be either qualified part-timers or from the full-time sales staff. Dealers, however, are estimated to account for only 10% of the micro training sales.
- For IS groups, there is an opportunity to provide "train-the-trainer" services. This can also be an additional market for CBT courseware to support the in-house staff on an ongoing basis.
 - From a recent survey of 1,080 IS information center managers, only 5% had trainers on staff within the first six months of operation. Within three years, over 50% of the information centers included end-user trainers on staff. An additional 36% were planning to add such skills to their information centers.
 - The major problem that the managers of these centers face is finding the combination of user friendliness, technical competence, and training experience necessary for success. This opens the opportunity for train-the-trainer programs to offer computer-assisted screening services for staff selection.

7. PS GREY AREA

- Prototyping is a grey area between consulting, software development, and training. It's a valuable tool in developing the design requirements and may be an end in itself, creating a "good enough" system. It provides a cost-effective training tool. The prototype model can also be used as a training vehicle.
- Prototyping is made possible by fourth-generation languages such as RAMIS, IDEAL, FOCUS, and PC Focus. Examples of firms who are using prototyping to cut development cost and time include:
 - Consolidated Edison of New York for tracking medical leave and cable inspections.
 - Union Mutual Life of Maine for management of employee benefits.
 - Equitable Leasing of New York for lease management.
- Another grey area is the application of analyst/programmer productivity tools. Staff training is a significant component of the effort to "install" such methodologies for an IS department. Companies offering these tools can increase their sale by 50% by integrating the training into their bid. Opportunities for incremental extensions, including ongoing support, abound in this type of implementation.

VI COMPETITIVE ANALYSIS

VI COMPETITIVE ANALYSIS

A. PROFESSIONAL SERVICES COMPETITIVE ENVIRONMENT

I. COMPONENTS OF THE PS BUSINESS

- The PS business is composed of five segments, as follows:
 - Consulting services--consultants advise clients on computer and communications issues that are usually management-oriented. Feasibility studies and computer audits are also examples of such studies.
 - Software development--this includes the design, programming, and installation of software on a custom basis for one specific client. It also includes requirements specification, conversions, testing, and data base loading activities.
 - Education and training--these services help users acquire new skills, techniques, and knowledge related to computer and communication systems. Products and services included are seminars, courses, computer courseware, videotapes, and publications.
 - Facilities management--this is the contract operation of customer-owned equipment on the customer's own premises. The service includes staff to operate and manage the client's computer facility.

- Systems integration--this includes the turnkey-like implementation of a complete hardware and/or software system for one customer's specific needs. Some components may be off-the-shelf items from third-party suppliers.
- Each of these segments of the PS market is considered in this analysis.

2. COMPETITION IN THE PS MARKET TODAY

- The INPUT estimate of the total PS market is \$10.52 billion in 1985. Exhibit VI-1 illustrates the distribution of this market between commercial and public sectors and by PS subsector. The top 10 competitors in overall market share, based on 1984 sales, are listed in Exhibit VI-2. These firms accounted for only 21% of the total PS business. The PS market is highly fragmented among many different types of firms. For most, however, their PS business is incremental to other primary products and services.
- By 1990, the PS market is forecasted by INPUT to grow to \$26.32 billion, at an average annual growth rate of 20% for all services and sectors. Exhibit VI-3 illustrates the distribution of the 1990 forecast by industry and service subsectors. Overall, the commercial sector is expected to grow somewhat faster than the public sector at a rate of 21% per year. Systems integration will expand most rapidly at the expense of software development.

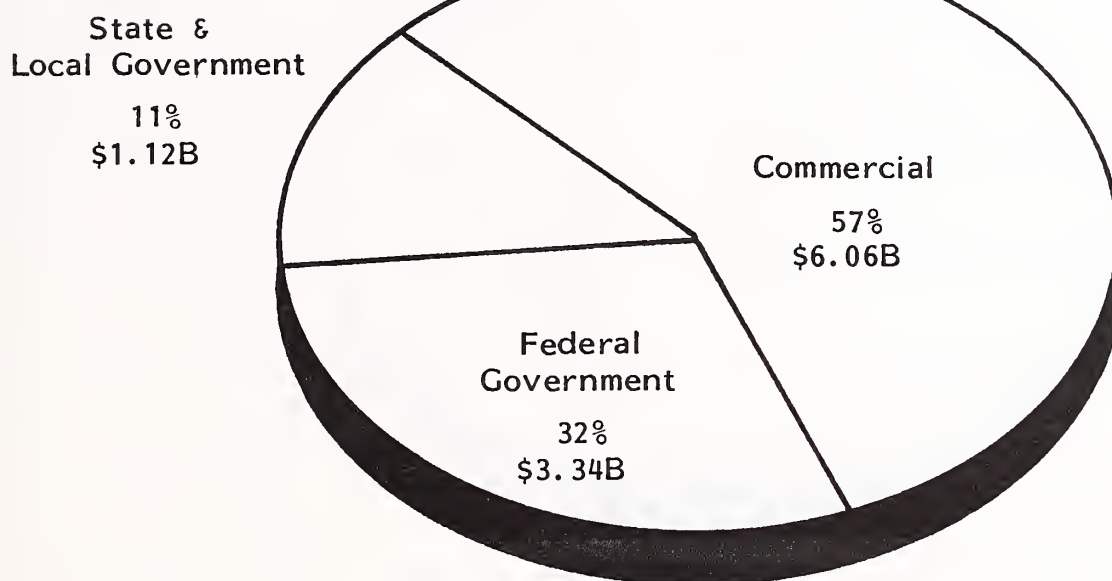
3. COMPETITION FOR COMMERCIAL PS

- Small changes are expected to occur in the distribution of the commercial part of the PS market, illustrated in Exhibit VI-4. Systems integration and training are growing rapidly and FM is expected to decline in the non-federal portion of the PS market.

EXHIBIT VI-1

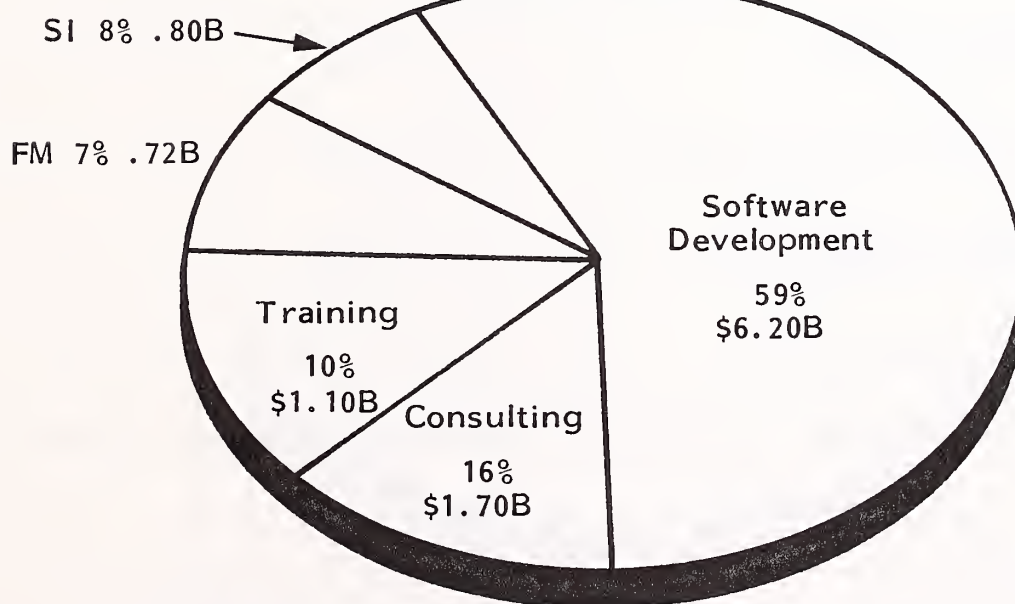
PROFESSIONAL SERVICES MARKET DISTRIBUTION FOR 1985

By Sector



\$10.52 Billion

By Service



\$10.52 Billion

EXHIBIT VI-2

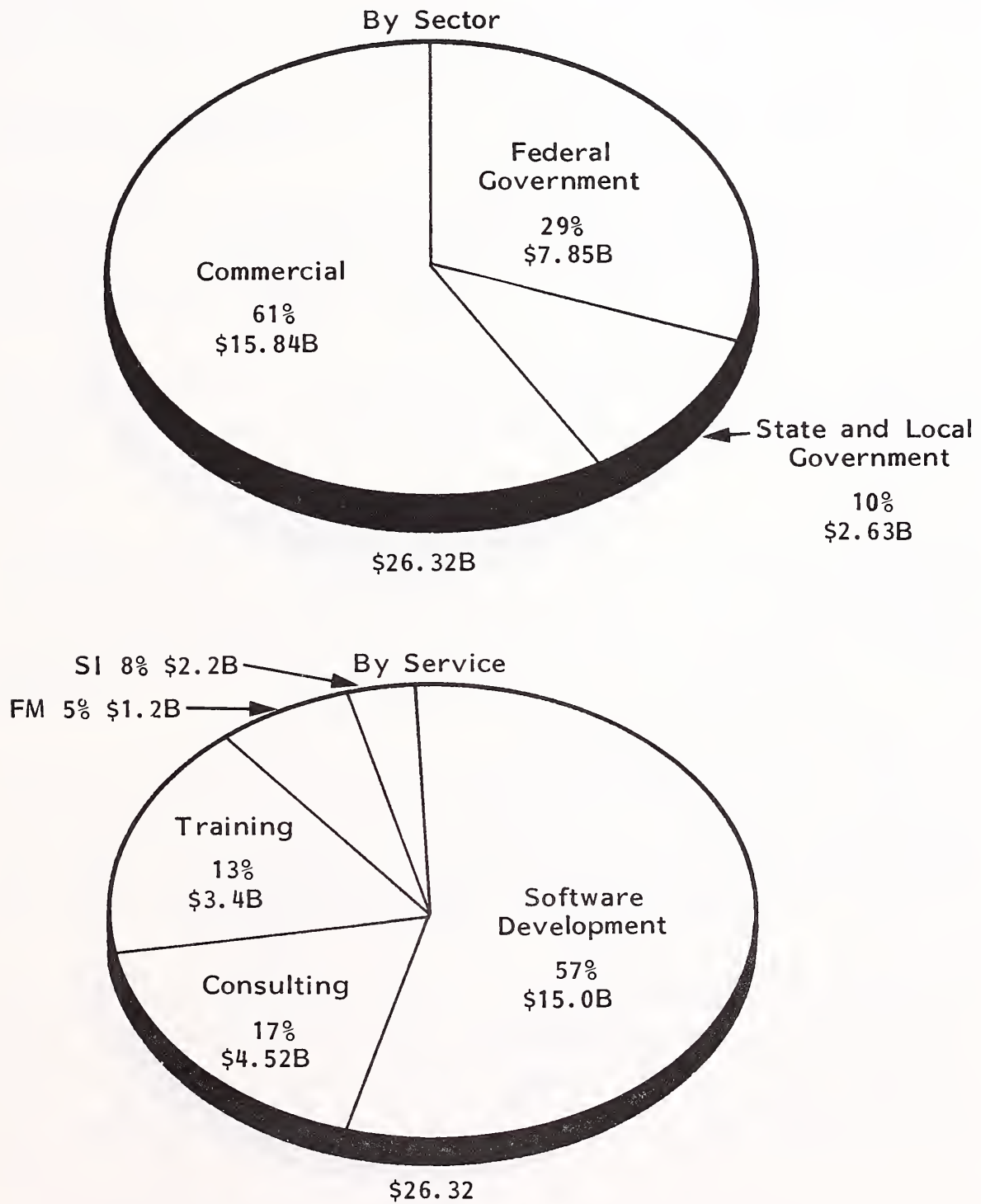
TOP 10 PROFESSIONAL SERVICES COMPANIES IN THE U.S.

RANK	COMPANY	PROFESSIONAL SERVICES SALES (\$ Millions)	MARKET SHARE (Percent)
1	Computer Sciences Corp.	\$340	4%
2	Arthur Andersen & Co.	297	3
3	Burroughs/SDC	223	3
4	Martin Marietta Data Systems	208	3
5	IBM Corporation	200	3
6	Electronic Data Systems (GM)	145	2
7	Logicon Corp.	121	2
8	Planning Research Corp.	120	2
9	McGraw Hill	107	1
10	MITRE Corp.	106	1
	Group Total	\$1,867	21%

*Reflects share of total 1984 revenues of \$8.8 billion, not addition of the top ten shares.

EXHIBIT VI-3

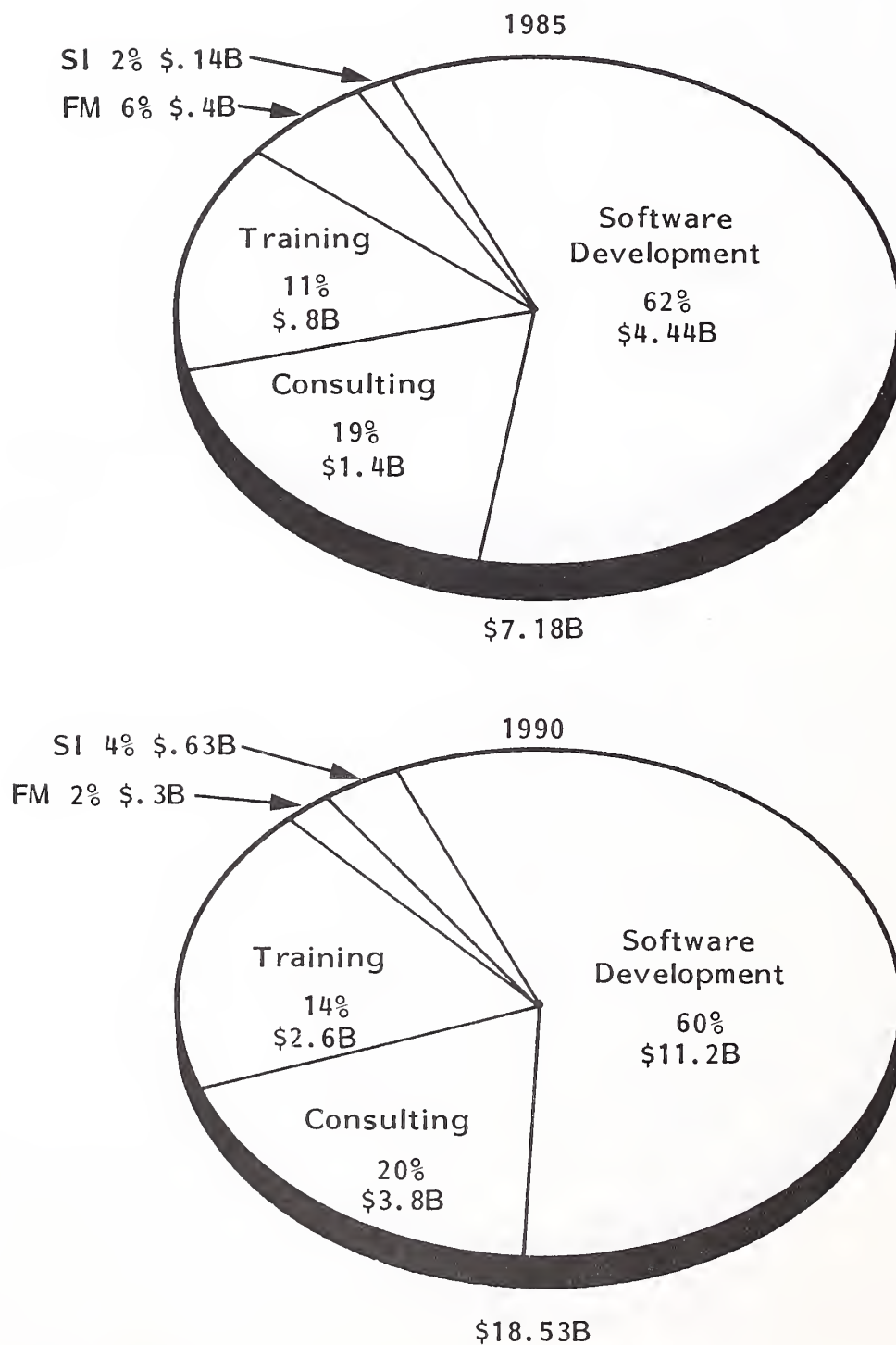
PROFESSIONAL SERVICES MARKET FORECASTS FOR 1990



AAGR = 21%
1985-1990

EXHIBIT VI-4

COMMERCIAL PROFESSIONAL SERVICES MARKET DISTRIBUTION FORECAST BY SERVICE



AAGR = 21%/year

- The top 10 competitors in this marketplace are listed in Exhibit VI-5. Commercial PS business is even more fragmented than the federal sector. Typically, the non-federal part of a market is more highly concentrated.
- The market share leaders in each service subsector are listed in Exhibit VI-6 for consulting services, Exhibit VI-7 for software development, Exhibit VI-8 for education and training, and Exhibit VI-9 for facilities management. Only in the FM service sector is there a concentration of business.

4. PS VENDOR PERFORMANCE

- The share of PS markets captured by independent PS firms is only about one-half (49%). The distribution of the PS market among other types of competition is illustrated in Exhibit VI-10.
- An increasing share is expected to fall to these other types of vendors as successful PS vendors are being acquired by industry giants and software producers.
- The relative shares are also expected to shrink for the "Big 8" accounting firms and the large management consulting firms. Their partnership-type corporate organizations do not lend themselves to acquisition of other companies.
- The share for the system manufacturers is also expected to shrink. With the exception of Burrough's acquisition of SDC, these companies work through value-added resellers (VARs) rather than software service organizations (SSO) and through system integrators, instead of growing internally.
- For the public PS vendors, the trend in revenues and income is illustrated in Exhibit VI-11. Revenues have shown a consistent growth from a 15% rate in 1982 to a 19% rate in 1985. Income, however, has been a very different story. Exhibits VI-12 and VI-13 give the details on which Exhibit VI-11 is based.

EXHIBIT VI-5

TOP 10 COMMERCIAL PROFESSIONAL SERVICE COMPANIES
IN 1984 U.S. REVENUE

RANK	COMPANY	PROFESSIONAL SERVICES SALES (\$ Millions)	MARKET SHARE (Percent)
1	Arthur Andersen and Company	\$198	3%
2	Computer Science Corp.	139	2
3	McGraw Hill	107	2
4	IBM Corp.	100	2
5	Computer Task Group Inc.	77	1
6	Martin Marietta Data Systems	73	1
7	Digital Equipment Corporation	72	1
8	GEISCO	71	1
9	Burroughs/SDC	67	1
10+	Peat Marwick & Mitchell	62	1
10+	Price Waterhouse	62	1
	Group Total	\$966	15%

+ = Tie in Rank

EXHIBIT VI-6

COMMERCIAL CONSULTING PROFESSIONAL SERVICES LEADERS IN U.S.

RANK	COMPANY	PROFESSIONAL SERVICES SALES (\$ Millions)	MARKET SHARE (Percent)
1	McGraw Hill	\$59	5%
2+	IBM Corporation	35	3
2+	A.D. Little	35	3
4	Martin Marietta Data Systems	25	2
5	Burroughs/SDC	20	2

+ = Tie in rank

EXHIBIT VI-7

COMMERCIAL SOFTWARE DEVELOPMENT SERVICES LEADERS IN U.S.

RANK	COMPANY	PROFESSIONAL SERVICES SALES (\$ Millions)	MARKET SHARE (Percent)
1	Arthur Andersen & Co.	\$125	3%
2	Computer Task Group Inc.	62	1
3	Digital Equipment Corp.	58	1
4	CAP Gemini DASD	55	1
5+	GEISCO	50	1
5+	IBM Corporation	50	1

+ = Tie in Rank

EXHIBIT VI-8

COMMERCIAL EDUCATION AND TRAINING
SERVICES LEADERS IN U.S.

RANK	COMPANY	U.S. PROFESSIONAL SERVICES SALES (\$ Millions)	MARKET SHARE (Percent)
1+	Arthur Andersen & Company	\$48	8%
1+	McGraw Hill	48	8
3	Deltak/Prentice-Hall	21	4
4+	IBM Corporation	15	3
4+	Electronic Data Systems	15	3

+ = Tie in Rank

EXHIBIT VI-9

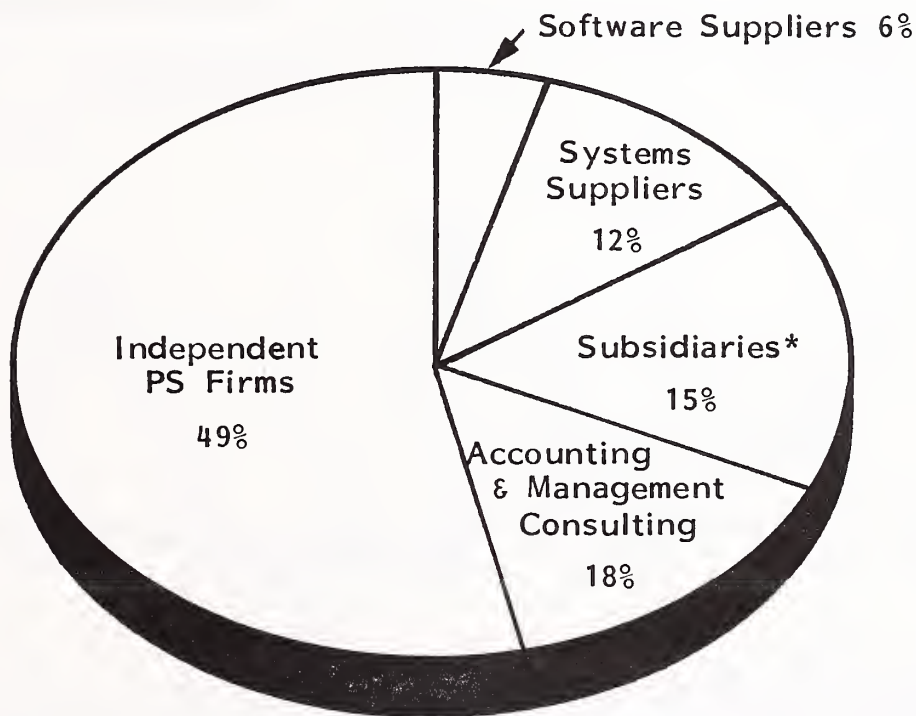
COMMERCIAL PROFESSIONAL SERVICES FACILITIES MANAGEMENT LEADERS IN U.S.

RANK	COMPANY	PROFESSIONAL SERVICES SALES (\$ Millions)	MARKET SHARE (Percent)
1	Computer Sciences Corporation	\$46	31%
2	Martin Marrietta Data Systems	17	11
3	Keane Corporation	16	11
4+	Computer Task Group Inc.	15	11
4+	Butler	15	11

+ = Tie in Rank

EXHIBIT VI-10

COMMERCIAL PROFESSIONAL SERVICES MARKETS
SHARES BY TYPE OF COMPANY



Total = \$7.2 Billion

* Subsidiary operations of large companies in other industries. (i.e., EDS/GM, GEISCO, MMDS, BCS, McDonnell Douglas ISG)

EXHIBIT VI-11

PUBLIC PROFESSIONAL SERVICES VENDORS PERFORMANCE

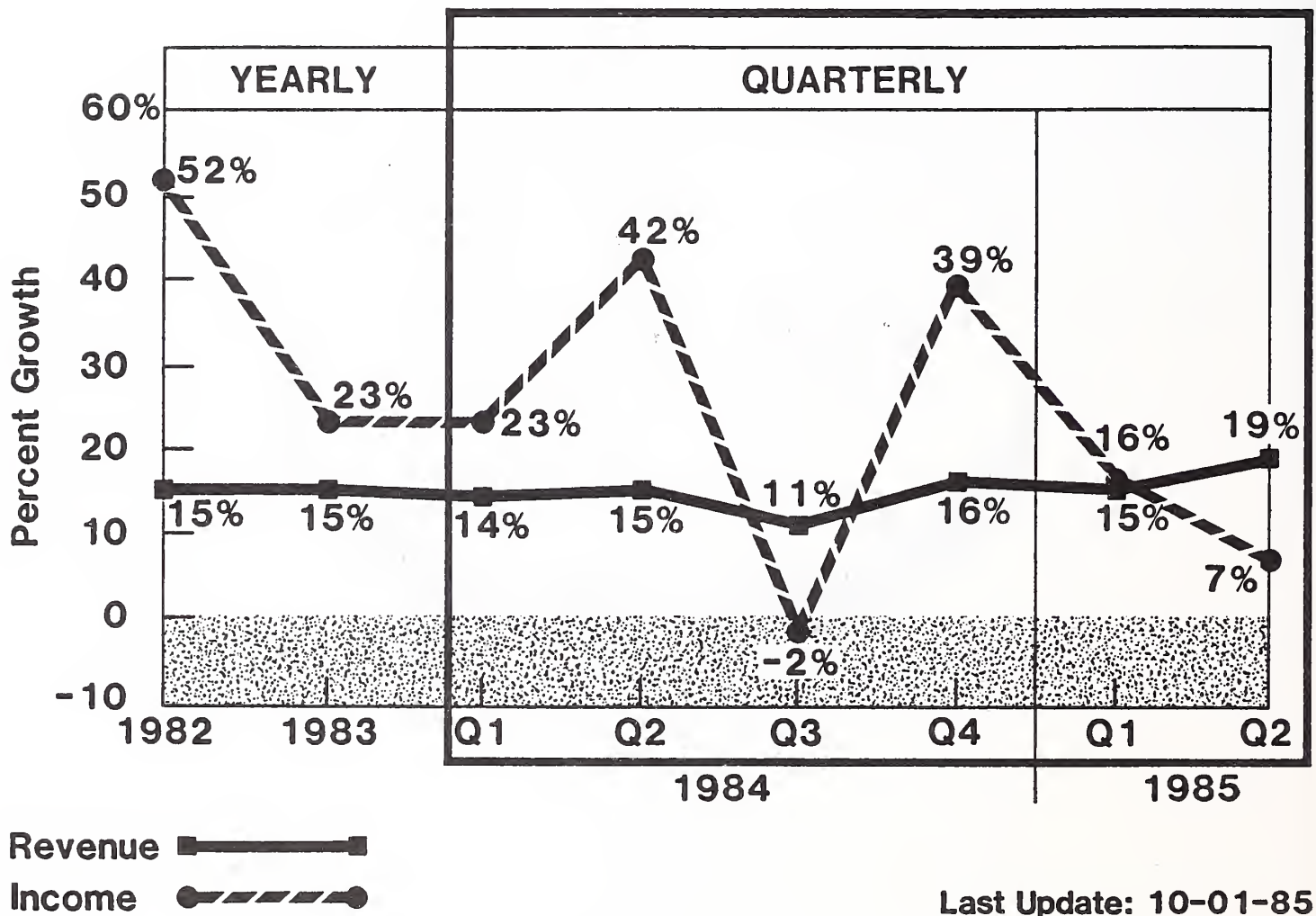


EXHIBIT VI-12

REVENUES OF PUBLIC PROFESSIONAL SERVICES COMPANIES

COMPANY NAME		FISCAL YEAR END	REVENUE (\$ Thousands)									GROWTH (Percent)			
			1983		1984					1985		1984/ 1983	LAST 3 ROLLING	LAST 2 ROLLING	
			Q4	TOTAL	Q1	Q2	Q3	Q4	TOTAL	Q1	Q2	Q3	%(+/-)	QUARTRS	QUARTRS
202 DATA SYS	10-31	1669	3648	627	491	553	503	2174	489	562	487	-40	-8	7	
ACT	12-31	2659	11185	2679	3235	2741	3227	11882	3036	3526	4050	6	23	4	
ADV.SYSTEMS	10-31	10003	39942	9274	9486	11967	10557	41284	11529	11254	18175	3	33	6	
AGS COMPUTER	12-31	46584	145911	53029	52944	56147	61960	224080	65742	70327	67617	54	26	14	
AM. MGT. SYS	12-31	20747	79196	20998	23023	25374	27611	97006	26647	27260	26750	22	16	9	
ANLYSTS INT.	06-30	7304	25600	8152	8754	9420	10368	36694	11954	12549	11792	43	38	18	
AUXTON COMP	12-31	5659	19515	5873	5635	6251	6146	23905	6453	7182	7100	22	17	12	
BDM INTERN'L	12-31	41681	151145	41607	45730	48838	55225	191400	50764	62021	63727	27	30	15	
BBN	06-30	25150	94470	27459	30031	29437	31875	118802	35294	41614	39211	26	34	17	
C.A.C.I.	06-30	30249	115344	26070	26736	24383	24622	101811	24961	23990	22818	-12	-7	-6	
COMP DATA	06-30	13039	48200	14086	14966	15028	14080	58160	12666	13097	13828	21	-10	-6	
COMP HORIZ	02-28	9140	30679	10164	10435	10588	11636	42823	11973	12507	12605	40	19	9	
CSC	04-01	168525	718880	185028	173895	172027	178684	709634	198887	187565	209286	-1	12	4	
COMP TASK GR	12-31	16136	53885	17377	18629	21876	24741	82623	26035	28166	29565	53	45	20	
DATA ARCHTS	11-30	5420	23545	3527	4586	4398	3026	15537	4264	5347	5415	-34	20	8	
DYNAMICS RES	12-25	15442	43663	11241	11944	12125	17760	53070	14633	14242	14448	22	23	9	
INTERMETRICS	02-28	9063	32821	10216	10537	11016	10869	42638	10587	11324	12273	30	8	3	
KEANE	12-31	6871	21659	7317	8430	8915	9166	33828	9951	10341	9462	56	21	11	
LOGICON	03-31	32692	120674	36691	39380	45541	39646	161258	43689	44100	50277	34	14	5	
PRC	06-30	76467	318906	79480	84919	78177	81770	324346	93931	118485	104778	2	31	18	
RAND INFO.	02-28	3735	12392	2842	2546	2753	2920	11061	2924	2611	2760	-11	2	1	
SYSCON CORP	11-30	26101	87015	24006	27253	26084	26687	104030	26174	28462	29867	20	9	2	
SYST.& COMP.	09-30	10816	45029	11787	12062	11746	12190	47785	12512	11874	10792	6	-1	-1	
TECHNALYSIS	12-31	2007	7941	2417	2317	2276	2938	9948	3128	3142	3176	25	35	15	
TOTALS		587159	2251245	611947	627964	637661	668207	2545779	708223	751548	770259	13	19	9	

INPUT ESTIMATE

24 COMPANIES

LAST UPDATED: 12-15-85

EXHIBIT VI-13

NET INCOME OF PUBLIC PROFESSIONAL SERVICES COMPANIES

COMPANY NAME		FISCAL YEAR END	NET AFTER TAX INCOME (\$ Thousands)									GROWTH (Percent)			
			1983-----		-----1984-----					-----1985-----			1984/ 1983	LAST 3 ROLLING QUARTERS	LAST 2 ROLLING QUARTERS
			Q4	TOTAL	Q1	Q2	Q3	Q4	TOTAL	Q1	Q2	Q3	%(+/-)		
202 DATA SYS	10-31	195	452	76	20	14	2	112	5	3	52	-75	-45	62	
ACT	12-31	50	396	-94	179	23	59	167	83	135	191	-58	279	61	
ADV.SYSTEMS	10-31	1084	4809	989	802	335	1064	3190	1166	1204	2489	-34	129	225	
AGS COMPUTER	12-31	2196	5785	1559	1307	1778	1195	5839	1925	1734	1854	1	19	16	
AM. MGT. SYS	12-31	718	2012	449	643	812	937	2841	1269	1658	1031	41	108	85	
ANLYSTS INT.	06-30	-213	-797	-310	-302	-149	78	-683	454	546	102	14	245	244	
AUXTON COMP	12-31	425	1732	470	360	490	241	1561	340	461	620	-10	8	27	
BDM INTERN'L	12-31	1964	6346	1747	1921	2051	2354	8073	2130	2512	2600	27	27	29	
BRN	06-30	1303	4260	1656	1879	1837	1978	7350	2190	2446	2349	73	30	29	
C.A.C.I. .	06-30	1287	1942	-777	1461	564	658	1906	770	553	297	-2	30	-58	
COMP DATA	06-30	771	2590	860	509	824	817	3010	723	582	638	16	-11	-8	
COMP HORIZ	02-28	626	1895	720	513	324	539	2096	643	666	500	11	16	39	
CSC	04-01	4225	15826	7081	4637	3446	12403	27567	7232	5199	4928	74	14	25	
COMP TASK GR	12-31	379	1454	337	511	538	714	2100	773	893	1096	44	99	90	
DATA ARCHTS	11-30	-1282	-1177	-319	322	230	367	600	306	364	291	151	312	19	
DYNAMICS RES	12-25	792	1007	-16	64	483	809	1340	437	252	-1049	33	-168	-246	
INTERMETRICS	02-28	106	319	192	119	147	166	624	155	183	-2615	96	-597	-1014	
KEANE	12-31	10	232	91	145	169	214	619	233	191	141	167	40	6	
LOGICON	03-31	1564	5363	1680	1843	2071	2123	7717	2210	2378	2511	44	27	25	
PRC	06-30	2885	11263	2304	2661	650	1625	7240	1398	2333	2136	-36	4	35	
RAND INFO.	02-28	2	-21	48	-47	-81	-892	-972	-236	-307	-270	-4529	-579	-140	
SYSCON CORP	11-30	1102	3495	895	1058	924	1188	4065	986	1103	1149	16	13	14	
SYST.& COMP.	09-30	1133	7498	1800	1589	-81	814	4122	627	97	-1082	-45	-111	-165	
TECHNALYSIS	12-31	272	928	224	250	271	276	1021	257	289	311	10	15	15	
TOTALS		21594	77609	21662	22444	17670	29729	91505	26076	25475	20540	593098	17	15	

* INPUT ESTIMATE

24 COMPANIES

LAST UPDATED: 12-15-85

B. VENDOR VIEWPOINTS ON THE COMPETITIVE ENVIRONMENT

I. IMPACTS ON PS MARKETPLACE

- The major impacts on the competitive environment as seen by the 25 vendor respondents to the INPUT survey research are:
 - IS professional staff shortages, 88%.
 - The economy and its subsequent impact on user spending for PS, 80%.
 - Increasing need for micro-mainframe links, 70%.
- IS managers share the vendors' view of the impact of the economy, but only on an industry-by-industry basis. Users do not share the view that IS staff shortages will have an impact on their need for more PS spending.
- Only one-half (48%) of these vendors see a major impact by the consolidation of IS and office systems on PS business opportunities. These vendors also see little impact from the integration of voice and data communications over the next two years. Users, however, put this item on the top of their list of needs.
- In terms of new working relationships, virtually every vendor interviewed (95%) favored marketing agreements. Typically, these are agreed to on an application- or industry-specific basis. One-half of these vendors see licensing agreements as also becoming significant in extending and expanding their PS business.
- These vendors are of the opinion that the most important skills to acquire to maintain a competitive edge are:

- Staff that is focused on specific application/industry expertise at the "business" level (95%).
- Staff with the ability to integrate a number of business applications into a "suite" (91%).
- The ability to create computer-based training programs for both clients and in-house training (83%).
- The ability to bid for and provide ongoing maintenance and support services (80%).
- All of these skills mean moving beyond the strictly technical level of logical design and programming into a realm where interpersonal communication skills become more important.

2. DOMINANT COMPETITION TODAY

- The consensus is that there are a few firms which other PS vendors feel are a step ahead of the others. Today these include (as ranked by vendor respondents):
 - Arthur Andersen & Company.
 - Computer Task Group (CTG).
 - Electronic Data Systems (EDS).
- Computer Sciences Corporation and EDS are considered the companies to beat in the federal government market. Small local groups and in-house IS departments are in general also seen as significant competition.

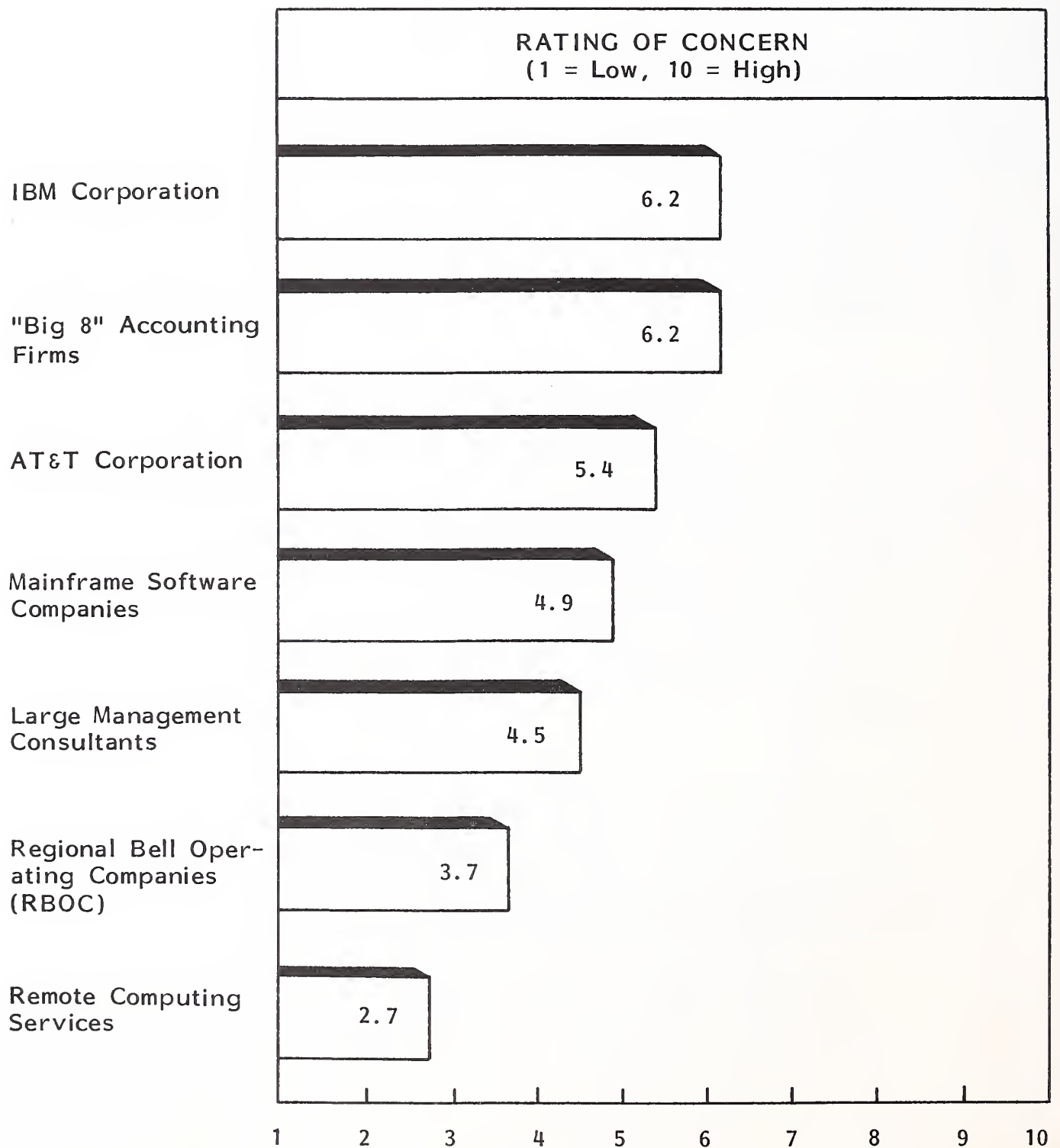
- EDS is now of even greater concern because of its acquisition by General Motors. The Hughes acquisition by GM also brings the prospects of state-of-the-art hardware into the picture for EDS. Arthur Andersen & Company is considered to have the edge because of its size (an estimated 4,500 employees in its PS operation) and the synergy with its auditing practices. CTG is seen as having momentum. It has been aggressively growing and acquiring high-quality local businesses.

3. EMERGING COMPETITION

- Vendors interviewed were asked to rate their concerns about some specific competitors; the results are illustrated in Exhibit VI-14. IBM was included as a reference point. IBM's strategy is to leverage the sales of its standard products through a network of system integrators, VARs, and SSOs as well as developing own business.
- AT&T and the Regional Bell Operating Companies (RBOCs) should definitely be of concern, particularly over the longer term. These organizations are tripping over each other in setting up all manner of "user service" organizations for consulting, design implementation, ongoing support, and even facilities management. Pacific Telesis has set up Spectrum Services as a PS firm for telecommunications system design and integration. U.S. West seems to offer a broad array of consulting and design services. Ameritech is moving into software and custom programming with its acquisition of Applied Data Resources.
- The mainframe software vendors are moving cautiously into the PS market via marketing agreements. Arthur Andersen & Company and MSA work closely together in the food marketing industry. Cullinet is setting up a network of PS firms to support turnkey IDMS data base implementations.
- PS vendors rate "Big 8" accounting firms as of most concern, particularly Arthur Andersen & Company. Users surveyed rank this source at the bottom

EXHIBIT VI-14

VENDOR RESPONDENT CONCERN FOR COMPETITION



for PS with only a 13% preference factor. Something is certainly out of balance in these opinions. The "Big 8" firms are expanding through marketing and licensing agreements with the software producers; Arthur Andersen & Company is by far the most aggressive. This strategy may shut out the large management consulting firms from the growth areas of systems integration and training. This would leave such firms in competition with local and in-house alternatives. Small local firms have a small edge in preference among the users surveyed (25% versus 18%).

4. FACTORS FOR SUCCESS

- In the vendors' view, the most significant factor for success in the PS business is staff quality, experience, and development.
- Other important factors include maintaining a focus on particular markets and services, preserving and protecting the firm's reputation, and developing some form of leverage with other products and services. Cost control is more important for the health of the business than as a competitive factor.
- In the buyer/users' view, the factors for success are the PS firm's prior experience, track record, reputation, and staff quality. Cost/price ranks sixth on the selection criteria list.

C. PROFESSIONAL SERVICES SEGMENT COMPETITION

I. INDEPENDENT PS COMPANIES

- Independent PS companies account for an estimated 49% of the market share. Exhibit VI-15 identifies the top 25 companies in this group. Few of these companies provide a complete range of services.

EXHIBIT VI-15

TOP 25 INDEPENDENT PROFESSIONAL SERVICES FIRMS
IN THE U.S. COMMERCIAL MARKET

RANK	COMPANY	1984 U.S. PROFESSIONAL SERVICES REVENUES (\$ Millions)				
		Total	Consulting	Software	Training	FM & SI
1	Computer Sciences Co.	\$139	\$ 20	\$ 31	\$ 5	\$ 83
2	Computer Task Group	77	-	62	-	15
3	CAP Gemini DASD	55	-	55	-	-
4	DBA Systems	54	11	40	3	-
5	Analytics International	44	7	37	-	-
6+	AGS Corporation	43	9	34	-	-
6+	Science Institute of America	43	5	14	3	21
6+	Computer Horizons	43	9	30	4	-
9	American Management Systems	37	9	24	4	-
10	CSA Computer	36	9	23	4	-
11	National Data Corp.	35	5	12	-	18
12	Keane Corp.	32	3	11	2	16
13	Advanced Systems	26	9	13	4	-
14	CompuCare Corp.	25	6	7	5	7
15	Logicon Corp.	24	5	9	5	5
16	Aspen Systems	23	-	21	2	-
17+	Continum Co.	21	7	11	3	-
17+	FBC Corporation	21	-	11	-	10
19	Consultec Corp.	20	12	8	-	-
20	System Control Corp.	17	4	13	-	-
21	Auxton	16	4	12	-	-
22+	Intermetrics	15	5	8	2	-
22+	Butler	15	-	-	-	15
22+	Computer Process	15	-	-	15	-
22+	CACI Co.	15	3	10	2	-

2. ACCOUNTING AND MANAGEMENT CONSULTING FIRMS

- The "Big 8" accounting firms and the major management consulting firms account for an estimated 18% share of the PS market. Arthur Andersen & Company is also perceived as the most significant competition by most other PS vendors. Three firms, AA & Company, Peat Marwick Mitchell, and Price Waterhouse, dominate all other competitors of this type with at least a 50% share of this group's PS sales. The list of the top 10 firms of this type in the PS business is provided in Exhibit VI-16.
- Recent banking failures have raised concern in Congress about conflict of interest between the auditing and services businesses at these firms. This echoes concern voiced for years by ADAPSO. One fear that has been expressed is that the audit function exerts undue influence on the user IS department which often reports through the chief financial officer. Such influence is certainly not reflected in the results of the end-user survey.

3. SUBSIDIARY OPERATIONS

- Subsidiary operations are PS vendors who are owned by other large companies. Typically, the parent company generates much of its revenue outside of the information processing industry; Exhibit VI-17 provides a list of the top 10 PS vendors in this category. This group accounts for a 15% share of the commercial PS market. When federal PS sales are included, this share increases to 21%. Information service firms are becoming increasingly interesting and valuable to the Fortune 100 companies. INPUT expects to see the share of the PS market held by this group to increase substantially over the next five years.

4. SYSTEMS MANUFACTURERS

- INPUT's ranking of systems manufacturers in the PS market is as follows:

EXHIBIT VI-16

TOP 10 ACCOUNTING AND MANAGEMENT CONSULTING FIRMS
IN COMMERCIAL PROFESSIONAL SERVICES

RANK	COMPANY	1984 PROFESSIONAL SERVICES REVENUES (\$ Millions)			
		Total	Consulting	Software	Training
1	Arthur Andersen & Co.	\$192	\$ 19	\$125	\$ 48
2+	Peat Marwick & Mitchell	62	6	47	9
2+	Price Waterhouse	62	6	47	9
4	A.D. Little	35	35	-	-
5	Touche Ross	26	3	17	6
6+	Deloit Haskens & Sells	23	2	21	-
6+	Ernest & Whitney	23	2	16	5
8	Booz Allen	16	6	8	2
9	Arthur Young & Co	15	4	11	-
10	Coopers & Lybrand	7	1	6	-

+ = Tie in Rank

EXHIBIT IV-17

TOP 10 SUBSIDIARY TYPE FIRMS
IN COMMERCIAL PROFESSIONAL SERVICES

RANK	COMPANY	1984 PROFESSIONAL SERVICES REVENUES				
		Total	Consulting	Software	Training	FM
1	McGraw Hill Information Services	\$107	\$59	—	48	—
2+	GEISCO/GE	72	18	50	4	—
2+	Martin Marietta Data Systems	72	25	29	1	17
4+	Electronic Data Systems/GM	44	11	17	—	16
4+	McDonnell Douglas ISG	44	13	27	4	—
6	Deltak/Prentice-Hall	43	—	14	21	8
7	Boeing Computer Service	23	6	16	1	—
8	Pinkerton Computer	15	2	2	—	11
9	Chase Econometrics/CMB	14	14	—	—	—
10	Contel Information Services	11	7	2	2	—

- IBM Corporation.
 - Digital Equipment Corporation.
 - Burroughs/SDC.
 - Control Data Corporation.
 - Sperry UNIVAC.
 - Honeywell Information Systems.
 - Hewlett-Packard.
- This category of competition accounts for an estimated 12% market share of the commercial PS business. This share is expected to decline as both IBM and Digital are expanding their use of system integrators and VARs as distribution channels. It is estimated that 10% of IBM systems sales flow through such channels today. This flow is expected to increase to 25% by 1990.

5. OTHER TYPES OF PS VENDORS

- The software product suppliers account for an estimated 6% share of the PS market. This should increase as more of these firms try to make up for slowing mainframe sales by increasing the services side of the business. Microcomputer dealers may pick up a PS business in the next five years through training and custom microcomputer program development.
- INPUT expects the biggest gains to come in the communications services industry. AT&T, the RBOCs, and the SCCs are scrambling to set up PS subsidiaries. GTE, Continental, and United Telecom are already in the business with small customer bases of their own.

D. COMPANY PROFILES

1. AMERICAN MANAGEMENT SYSTEMS, INC., ARLINGTON (VA)

- American Management Systems, Inc. (AMS), founded in 1970, provides professional services, processing and micrographics services, and applications software. Since 1982, AMS's marketing has focused primarily on larger financial services firms, federal government agencies, state and local governments, colleges and universities, energy companies, and telecommunications companies.
- Total 1984 revenue reached \$97 million, a 22% increase over 1983 revenue of \$79.2 million. Net income rose 41% from \$2 million in 1983 to over \$2.8 million in 1984. A five-year financial summary is shown in Exhibit VI-18.

2. COMPUTER HORIZONS CORPORATION, NEW YORK (NY)

- Computer Horizons Corporation (CHC) is a custom software development professional services company. CHC provides system analysis, design, and programming services to large companies, primarily in the communications and financial services industries. Fiscal 1985 revenues reached \$44.4 million. Approximately 95% of CHC's revenue is derived from professional services. Exhibit VI-19 summarizes recent five-year financial performance.
- Computer Horizons' management attributes the increase in revenue to the broadening of their customer base beyond the communications and financial services industries with significant contributions to revenue growth from the utility and manufacturing sectors. Decreases in net income and earnings per share are attributed to higher direct costs associated with pricing pressures and higher selling, administrative, and general expenses associated with the addition of eight new district offices and several senior managers to direct certain corporate and regional activities.

EXHIBIT VI-18

AMERICAN MANAGEMENT SYSTEMS, INC.
 FIVE-YEAR FINANCIAL SUMMARY
 (\$ Thousands, Except per Share Data)

ITEM \ FISCAL YEAR	1984	1983	1982	1981	1980
Revenue	\$ 97,006	\$ 79,196	\$ 69,642	\$ 65,634	\$ 58,505
• Percent increase from previous year	22%	14%	6%	12%	22%
Income (loss) before taxes	\$ 4,830	\$ 3,832	\$ (2,253)	\$ (2,030)	\$ 3,679
• Percent increase (decrease) from previous year	26%	270%	(11%)	(155%)	69%
Net income (loss)	\$ 2,841	\$ 2,012	\$ (1,086)	\$ (749)	\$ 2,149
• Percent increase (decrease) from previous year	41%	285%	(45%)	(135%)	25%
Earnings (loss) per share	\$ 1.70	\$ 1.21	\$ (0.67)	\$ (0.46)	\$ 1.40
• Percent increase (decrease) from previous year	24%	281%	(46%)	(133%)	16%

EXHIBIT VI-19

COMPUTER HORIZONS CORPORATION
FIVE-YEAR FINANCIAL SUMMARY
(\$ Thousands, Except per Share Data)

ITEM \ FISCAL YEAR	2/85	2/84	2/83	2/82	2/81
Revenue	\$ 44,411	\$ 34,380	\$ 20,349	\$ 14,464	\$ 10,924
• Percent increase over previous year	29%	69%	41%	32%	10%
Income before taxes	\$ 4,108	\$ 4,510	\$ 1,520	\$ 830	\$ 566
• Percent increase (decrease) from previous year	(9%)	197%	83%	47%	(23%)
Net Income (a)	\$ 2,019	\$ 2,250	\$ 766	\$ 424	\$ 293
• Percent increase (decrease) from previous year	(10%)	194%	81%	45%	(19%)
Earnings per share (b)	\$ 0.78	\$ 0.91	\$ 0.35	\$ 0.18	\$ 0.13
• Percent increase (decrease) from previous year	(14%)	160%	94%	38%	(28%)

- (a) Restated to reflect cumulative effect of a change in accounting principles.
(b) Adjusted to reflect a 3-for-2 common stock split paid in July 1983.

- Computer Horizons derives its revenue from professional services, primarily in the custom computer software area, providing system analysis and design and programming services. A two-year source of revenue (\$ millions) by service sector follows:

	<u>2/85</u>	<u>2/84</u>
Professional Services		
Communications	\$20.5	\$15.1
Financial services	10.7	13.6
Other (utilities, manufacturing, defense)	12.9	5.5
Interest and Other	<u>0.3</u>	<u>0.2</u>
	\$44.4	\$34.4

3. COMPUTER SCIENCES CORPORATION, EL SEGUNDO (CA)

- Computer Sciences Corporation (CSC) is the largest independent professional services company in the industry. Serving government and commercial clients, CSC provides system engineering and development, communications engineering, facilities management, and turnkey computer-communications systems. Processing services are offered through INFONET, an international network service, and from several other operations for tax processing, distribution services, and credit reporting services. CSC's fiscal 1984 revenue was \$723.5 million. A five-year financial summary is shown in Exhibit VI-20.
- 1985 income before taxes includes a gain of \$9.5 million from the sale of Paid Prescriptions, Inc., net of charges for the phase-down of certain operations.
 - In December 1984, CSC sold Paid Prescriptions, a wholly-owned subsidiary that provides prescription drug claims processing, to Porex Technologies Corporation for \$14.7 million and 559,906 shares of Porex common stock valued at \$13.3 million.

EXHIBIT VI-20

COMPUTER SCIENCES CORPORATION (CSC)
 FIVE-YEAR FINANCIAL SUMMARY
 (\$ Thousands, Except per Share Data)

ITEM \ FISCAL YEAR	3/29/85	3/30/84	4/1/83	4/2/82	4/3/81
Revenue	\$ 723,493	\$ 712,224	\$ 694,914	\$ 630,174	\$ 600,593
. Percent increase from previous year	2%	2%	10%	5%	33%
Income before taxes	\$ 41,057	\$ 30,483	\$ 32,524	\$ 33,550	\$ 47,096
. Percent increase (decrease) from previous year	35%	(6%)	(3%)	(29%)	9%
Net income	\$ 27,718	\$ 18,266	\$ 17,888	\$ 17,781	\$ 24,725
. Percent increase (decrease) from previous year	52%	2%	1%	(28%)	9%
Primary earnings per share	\$ 2.02	\$ 1.32	\$ 1.32	\$ 1.31	\$ 1.82
. Percent increase (decrease) from previous year	53%	-	1%	(28%)	7%

- Also in December 1984, CSC established reserves for the planned phase-down of certain products and services for a limited number of markets.
- Computer Sciences Corporation derives its revenue from a number of information services. A two-year source of revenue (\$ millions) by operating group follows:

	<u>3/85</u>	<u>3/84</u>
Systems Group (professional services)	\$511.0	\$512.1
Information Network Services Group (remote computing services)	92.0	98.1
Industry Services Group (mixed)	<u>120.5</u>	<u>102.5</u>
	\$723.5	\$712.2

4. COMPUTER TASK GROUP, INC., BUFFALO (NY)

- Computer Task Group, Inc. (CTG) is an independent supplier of computer-related professional services to the commercial market in the U.S. In addition, CTG offers processing services and software products. Until the first quarter of 1984, CTG marketed turnkey systems to the trucking industry. Fiscal year 1984 revenues reached \$82.9 million. Exhibit VI-21 summarizes the five-year financial performance.
- CTG management attributes increases in revenue and earnings to increased demand for services, improvements in branch operations, and two acquisitions completed in 1984 that accounted for 19% of revenue increases.
- Holvick Corporation of Detroit (MI), acquired January 1, 1984, specializes in professional services to the automotive industry.

EXHIBIT VI-21

COMPUTER TASK GROUP, INC.
FIVE-YEAR FINANCIAL SUMMARY
(\$ Thousands, Except per Share Data)

FISCAL YEAR ITEM	1984	1983	1982	1981	1980
Revenue	\$ 82,923	\$ 54,193	\$ 40,116	\$ 38,085	\$ 24,935
• Percent increase from previous year	53%	35%	5%	53%	38%
Income before taxes	\$ 4,054	\$ 2,564	\$ 2,109	\$ 2,076	\$ 1,826
• Percent increase from previous year	58%	22%	2%	14%	82%
Net income	\$ 2,108	\$ 1,454	\$ 1,144	\$ 1,271	\$ 1,006
• Percent increase (decrease) from previous year	45%	27%	(10%)	26%	59%
Earnings per share (a)	\$ 1.02	\$ 0.75	\$ 0.62	\$ 0.75	\$ 0.84
• Percent increase (decrease) from previous year	36%	21%	(17%)	(11%)	50%

(a) Restated to reflect a 4-for-3 stock split declared April 27, 1983 for stockholders of record on May 13, 1983.

- Amtec Systems, Inc. of Los Angeles (CA), acquired July 1, 1984, provides professional services in the government, military, and aerospace fields and operates as a wholly-owned subsidiary of CTG.
- INPUT estimates that 93% of CTG revenue in 1984 was derived from professional services, an increase of 64% over the previous year. Six percent was derived from processing services provided by the Service Bureau Division. The remaining 1% was derived from the closed Application Products Division, interest, and other. A three-year summary of source of revenue (\$ thousands) by each operating division follows:

	<u>1984 (a)</u>	<u>1983</u>	<u>1982</u>
Professional Services	\$77,370	\$47,177	\$34,163
Service Bureau	4,660	3,868	3,333
Application Products (b)	663	2,789	1,966
Interest and Other	<u>230</u>	<u>359</u>	<u>654</u>
	\$82,923	\$54,193	\$40,116

(a) INPUT estimate

(b) Discontinued operations in 1984

5. SCIENCE APPLICATION INTERNATIONAL CORPORATION, LA JOLLA (CA)
 - In August 1984, Science Applications, Inc. (SAI) was merged into its parent holding company, Science Applications International Corporation (SAIC). As a result of this reorganization, all business and operations of SAI are now conducted directly by SAIC and all officers and employees of SAI have become officers and employees of SAIC. Fiscal year 1984 revenues reached the \$250 million level. Exhibit VI-22 summarizes five-year financial performance.
 - One hundred percent of SAIC's computer services revenue was derived from professional services. SAIC's estimated \$250 million in computer services revenue is about equally divided between systems and applications software

EXHIBIT VI-22

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION (SAIC)

FIVE-YEAR FINANCIAL SUMMARY

(\$ Thousands, Except per Share Data)

FISCAL YEAR ITEM	1/85	1/84	1/83	1/82	1/81
Revenue	\$ 420,297	\$ 354,366	\$ 290,260	\$ 238,474	\$ 187,290
. Percent increase from previous year	19%	22%	22%	27%	24%
Income before taxes	\$ 26,619	\$ 24,803	\$ 23,722	\$ 12,419	\$ 8,625
. Percent increase from previous year	7%	5%	91%	44%	40%
Net income	\$ 14,736	\$ 13,255	\$ 12,193	\$ 6,559	\$ 4,641
. Percent increase from previous year	11%	9%	86%	41%	38%
Earnings per common share	\$ 1.70	\$ 1.58	\$ 1.55	\$ 0.87	\$ 0.65
. Percent increase from previous year	8%	2%	78%	34%	30%

development and the designing of customized integrated systems. The majority of the company's revenue (87%) is derived from U.S. government contracts.

- SAIC management attributes the dramatic increase in computer services revenue as a percent of total revenue to a corporate shift in emphasis to providing systems integration services.
- As shown below, the company's growth is directly related to receipt of contract awards and contract performance:

	<u>1/85</u>	<u>1/84</u>	<u>1/83</u>
Number of Contracts			
Awarded	1,985	1,288	1,398
Completed	1,646	1,430	1,635
In Process at Year-End	1,808	1,469	1,611

- The average value per contract awarded was \$227,000 in 1985, \$202,000 in 1984, and \$266,000 in 1983.

VII CONCLUSIONS AND RECOMMENDATIONS

VII CONCLUSIONS AND RECOMMENDATIONS

A. BASIC STRATEGIES FOR SUCCESS

I. SEEKING THE "HIGH GROUND" OF SPECIALIZATION

- The PS business was built on the basis of economies of specialization, government software development being the one exception. In the areas of consulting, training, and facilities management, the successful companies have focused on a relatively narrow set of criteria for business development. Examples include:
 - Finance and accounting applications by AA & Company.
 - Networking implementations by CSC.
- The systems manufacturers and software suppliers offered only the services needed to enhance their mainstream products. This original approach is still the best bet for maintaining good profit margins, if not for the most rapid revenue growth.
- Specialization requires the following activities:
 - Careful analysis and thorough planning.

- The willingness to take the risk of selecting a few longer-term alternatives and foregoing other short-term opportunities.
- Investment in developing the proprietary capabilities.
- A planned direction can accommodate some opportunistic activity. Develop a business evaluation process. If any opportunity contributes at least 50% of its residual results toward the strategic objectives, it is worthwhile. If not, it takes valuable resources out of the mainstream of the strategic plan. The successful corporation believes in and adheres to its strategic plan.

2. SCENARIO FOR SUCCESS

- The IS buyers give the advantage to PS firms in the following areas:
 - Nationwide coverage.
 - Timeframe for action.
- The factors are becoming more important as the support for networks and end-user computing grows. One key to success, then, is a nationwide presence. For the Fortune 1400 market, this means ability to provide service in some 15 to 20 geographic locations in the U.S. The big accounting and management consulting firms have this advantage. Computer Task Group has developed this advantage through the acquisition of local firms.
- Successfully dealing with the "time for action" issue is somewhat aligned with nationwide presence. Small local firms have more difficulty maintaining responsiveness and profitability. In large firms, resources and priorities can be juggled more easily. If the investment can be made in a sophisticated telecommunications system, resources can be redeployed electronically.

- IS management favors in-house alternatives because of the concern for control. PS vendors can do much more to relieve this concern, but it requires more use of fixed-price contracts and more use of automated cost/time management techniques.

B. VENDORS NEED TO BE MORE IN TOUCH WITH THE BUYERS

I. DIFFERENCES OF OPINION ON IMPACT FACTORS

- Most vendors surveyed (88%) believe that IS staff shortages will have a favorable impact on their PS business. Few users interviewed (41%) see a staff shortage affecting either their implementation plans or need to consider PS alternatives. IS management feels that staff qualifications and application and industry experience factors favor in-house alternatives. IS management needs to be educated by the PS vendors if they are expected to buy the message that PS vendors have the edge on staffing. This may be an issue worth pursuing on a group basis through ADAPSO.

2. DIFFERENT VIEWS OF APPLICATION PRIORITIES

- IS management feels that integration of voice and data communications is a significant need while few vendors consider this as a significant opportunity.
- Integrating voice and data communications requires dealing with many suppliers of equipment and services. The task is project oriented, requiring a number of specialists for a short period of time. Once the network is designed and implemented, staffing needs are diminished. Implementation requires coordination on a nationwide scale. These factors all favor PS vendors.
- Today, IS management has few places to turn to. AT&T and the RBOCs are just getting organized. Both are relying on networks of local independent consultants to fill user needs.

- Many users (75%) want to set up systems which integrate electronic graphics, composition, and electronic printing. The need exists for replacing traditional print shop operations for many applications such as policies, procedures, and product documentation. Hardware and software are available but the analysis and integration needs are not being met. This is an excellent functional niche market for PS vendors.
- PS vendors feel that there are significant opportunities in setting up main-frame data bases and information centers to support end-user computing. IS management does not agree. Both of these activities require a great deal of knowledge about the user's organization for success. IS management believes that they have a corner on that information.

C. MARKET SELECTION STRATEGIES

I. MARKET SELECTION BY INDUSTRY

- Deregulation and the resulting changes in the competitive environment is creating the pressure for quick changes and rapid implementation of supporting systems. The industries undergoing these changes now include:
 - Telecommunications--new service offerings need to be supported by new order processing, billing, and accounting systems.
 - Banking--elimination of traditional boundaries has created a need for mergers and consolidations. This, in turn, requires replacement or conversion of existing systems.
 - Trucking--elimination of route-and-rate tariffs now opens the door to incremental pricing of services and use of telemarketing techniques for service sales.

- Foreign competition in manufacturing is the driving force for automation of both production and business administration. In both areas there are significant opportunities in systems integration, consulting, and end-user training.
- Changing population demographics will continue to make the health care industry an excellent market for the next 20 years. Health claims processing is a major application opportunity. Integrated patient care and billing systems are needed; patient data exchange systems will be in demand.

2. EXTENDING THE CUSTOMER BASE BY COOPERATIVE ACTION

- Most PS vendors (95%) are using marketing agreements to extend the markets for their services. These agreements are used to combine expertise for very specific applications and industry situations. This is an excellent way to overcome IS management's prejudice about in-house talent being better qualified. This is also a good approach to dealing with the risk of fixed price contracts and the problem of eroding profit margins. Each partner now is being paid more for what they know rather than for time spent moving down the learning curve. Licensing agreements, joint ventures, and more formal forms of marketing agreements are also emerging. The key issue is forming teams to offer better price and performance at a lower risk to all parties.

D. MEETING CHANGING RESOURCE DEMANDS

I. SOURCE OF KEY PERSONNEL

- Personnel are readily available; the problem is selecting the producers from the knowledgeable drones. In telecommunications, AT&T will eliminate 45,000 positions in 1986. In the banking industry, consolidations and belt tightening are putting thousands of people on the job market.

- Traditional in-house, one-on-one interviewing techniques will not be very effective. Team interviewing requests for previous position descriptions or even proposals help identify the producers. PS vendors should consider staffing as an active strategic task. Requirements should be part of the product master plan and working relationships should be established with professional recruiters to fill needs.

2. USING FEDERAL BUSINESS TO FUND SUPPORT SERVICES

- While profit margins on federal PS business are low (i.e., in the 2-10% range), G&A costs are somewhat higher. These higher costs pay for a relatively sophisticated infrastructure of supporting services, including contract administration staff, cost/schedule management programs, design and development methodology experts, documentation specialists, and skills cost accountants. All of these capabilities are very important in reducing risks and maintaining profit margins for fixed-price contracts and systems integration projects.
- There is, of course, a significant price to pay. Establishing a modest position in the federal non-defense market may take two to five years at a cost of \$3 million per year before return is generated. Developing the PS support infrastructure in this manner, however, brings more discipline into the operation.

3. FUNDING PRODUCT DEVELOPMENT

- Profit margins on PS increase substantially when coupled with products. Product development starts with a statement of strategy in the business plan. This is a statement that specific development objectives are going to be pursued. The best starting point is, of course, from existing efforts and expertise.

- Once the objectives are set, then some level of priority must be given to ensure that the technical staff make time for development.
- Commitment of resources can be done on a "background basis." This means that selected professional staff have a "background" assignment to work on when not able to directly bill a specific client project.
- Background commitment saves resources at the expense of time to completion. This approach, however, has much to recommend it to the PS vendor.
 - The key to success is to form a team with a vested interest in the successful completion of development, even though effort is on a part-time basis. Let the team manage the contention problems with the customer day-to-day business. Support the development team with computer, documentation, and promotional resources.
 - Upon introduction, spin off some team members into direct support with the promise of a dedicated business unit if initial efforts are judged successful and the group's business plan projections are made. Using this type of approach will conserve the firm's resources, allow the staff to earn "sweat" equity, and keep the focus on bringing a product to market quickly. This approach also can be useful in keeping the staff together in the face of increasing demands.

APPENDIX A: QUESTIONNAIRE

APPENDIX A
QUESTIONNAIRE

Study Title: PROFESSIONAL SERVICES MARKETING DIRECTIONS

Type: I.S. USER TELEPHONE

Interviewer Instructions:

The purpose of this survey is to ask management in end-user Information Systems Departments (ISD) about their use of the following professional computer related services:

1. Consulting ... feasibility studies, analysis
2. Custom Software system design, programming
3. Computer Education and Trainingall types
4. Facilities Management of User-Owned Equipment
5. System Integration..... Equipment, Software, Training

The key issue is how much of this activity an end user will buy from outside sources, as opposed to using internal staff. The timeframe is:

Past 12 months for historic and status questions

Next 12 months (i.e., 1986) for future questions

1.0 USER BUYING PATTERNS

1. How has the ISD budget changed:

- a. Change of 1985 over 1984 _____%
- b. Expected change of 1986 over 1985 _____%
- c. ISD budget for CY/FY 1985 (or percent of total expenses) \$ _____%

2. Does 1985 spending include the following professional services (Y/N)

- | | Used
(Y/N) | If Yes
Sources | \$\$/percent
Spent |
|------------------------------|---------------|-------------------|-----------------------|
| a. IS Consulting | | | |
| b. Custom Software | | | |
| c. IS Education and Training | | | |
| d. IS Facility Management | | | |
| e. System Integration | | | |

3. For these services purchased, how were they applied:

Mainframe Only (percent)	Micro Only (percent)	MF/Micro Other (percent)
-----------------------------	-------------------------	-----------------------------

- a. IS Consulting
- b. Custom Software
- c. IS Education and Training
- d. IS Facilities Management
- e. System Integration

4. For these services in 1986, do you expect a change in this distribution (Y/N) _____

If YES, describe why: _____

5. What NEW major applications are planned for next 12 months:

Application Type	Source In/Ext.	If EXTERNAL, Sources (Type or Vendor)
---------------------	-------------------	--

a.

b.

c.

6. Does the responsibility of your IS department include (Y/N) :

Area	Today	In Future
a. Office Systems (WP)		
b. Phone Systems (PBX)		
c. Phone Services		
d. Data Communications		
e. Printing Services		

2.0 USER SATISFACTION (Only for users of subject services)

1. For services you have used in the past 12 months

Service Used	Vendor MOST Competent	Vendor LEAST Competent
a. Consulting		
b. Software Development		
c. Education and Training		
d. Facilities Management		
e. System Integration		

2. RATE the following factors (1 = low, 10 = highest) in selecting a firm for for these IS services:

- | | |
|------------------------------|-------------------------------|
| a. Track Record _____ | b. Executive Reference _____ |
| c. Industry Experience _____ | d. Firm's Size _____ |
| e. Prior Work _____ | f. Auditor's Reference _____ |
| g. Price Quote _____ | h. IBM Reference _____ |
| i. Individual Expert _____ | j. Staff Qualifications _____ |
| k. Other _____ | |

3. What types of such professional services are needed but not offered such vendors:

4. In evaluating external versus internal sources for such services, which of the following factors favor each sources (external/internal):
 - a. Industry Experiences _____
 - b. Time Frame _____
 - c. Application Experience _____
 - d. Cost/Price _____
 - e. Corp. Policy/Attitude _____
 - f. Staff Experts _____
 - g. Past Experience _____
 - h. Control _____
 - i. Nationwide Coverage _____

3.0 IMPACT OF END-USED COMPUTING

1. For "End-User Computing" (i.e., personal computers outside of ISD), does your company have/offer (Y/N):
 - a. A writtern policy on use of micros _____
 - b. A policy on procurement of micros _____
 - c. A link from micros to the mainframe computer _____
 - d. Access from micros to mainframe data bases _____
 - e. Standards for micro hardware procurements _____
 - f. A special support staff to assist micro users _____
 - g. Standards for micro software procurements _____
 - h. An internal "Information Center" for remote users _____
 - i. Standards for micro program development _____
 - j. A policy on end user-generated micro applications _____
 - k. ISD support of end user-generated micro applications _____
 - l. A migration path from user groups to IS staff _____

2. What sources have you used for the following end-user computing services:

Service	Source Internal/External
a. Education and Training	
b. Spreadsheet Design	
c. Data Base Setup	
d. Custom Micro Program	
e. Electronic Mail	
f. Mainframe-Micros Linkup	
g. PC System Documentation	
h. Data Security	
i. Information Center Setup	

3. If you have a special micro user support/information center, what are the MOST important personnel needs in staffing that center.

4.0 IMPACT OF ECONOMY AND TECHNOLOGY ON PLANS

1. Will the state of the U.S. economy have a significant impact on plans for using external Professional Services (Y/N) _____

If YES, then explain impact:

2. Is there specific technology which can have an impact on your use of external Professional Services (Y/N)

If YES, then explain technology and impact:

3. Do you foresee a shortage of IS professionals that will impact your plans (Y/N) _____

If YES, how will impact be felt, and overcome:

4. Do you foresee a need for staff in IS with the following expertise (Y/N):

- | | |
|-----------------------------|----------------------------|
| a. BASIC Programmer _____ | b. PASCAL Programmer _____ |
| b. UNIX Programmer _____ | d. "C" Programmer _____ |
| e. Spreadsheet Design _____ | f. FORTH Programmer _____ |
| g. PC User Trainers _____ | h. Network Designer _____ |
| i. PC DBMS Expert _____ | j. Security Expert _____ |
| k. Other _____ | |

5. Do you have plans for developments in any of these general applications areas (Y/N):

Plans (Y/N)	Sources External/Internal
----------------	------------------------------

- | | |
|--|--|
| a. Decision Support | |
| b. Expert Systems (AI) | |
| c. Phone and Data Networks | |
| d. Electronic Mail System | |
| e. Voice Mail System | |
| f. Electronic Graphics,
Printing and Publishing | |

5.0 CONTRACTING FOR PROFESSIONAL SERVICES

1. If you are buying these services, what type of contract will you prefer (Y/N):

Fixed Price Time and Charges Fair Cost \$/hr.

- a. Training
- b. Software Development
- c. Consulting
- d. System Integration
- e. Professional Services
Facilities Management

2. Do you need approval from outside IS for contracts for these IS services (Y/N):

If YES, explain approval process:

3. In general, what is your opinion of the following types of Professional Services vendors:

- a. Accounting firms (i.e., AT&T, Peat Marwick) _____

- b. Software vendors (i.e., Cullinet, MSA) _____

- c. Large Management Consulting Firms (i.e., Booz Allen, McKensey) _____

- d. Small Management Consulting Firms (i.e., Local Independents) _____

- e. Professional Services Development Firms (i.e., CTG, EDS) _____

END OF USER SURVEY

APPENDIX B: SURVEY FORMS

APPENDIX B

SURVEY RESEARCH FORMS

(I.S. MANAGEMENT) SURVEY FORM
PROFESSIONAL SERVICES VENDOR SURVEY FORM

Study Title: PROFESSIONAL SERVICES MARKETING DIRECTIONS

Type: PROFESSIONAL SERVICES VENDOR TELEPHONE

Interviewer Instructions:

The purpose of this survey is to ask key management in Professional Services vendor companies about opportunities, trends, strategies and the Professional Services market. For this survey, the Professional Services market is subdivided into the following segments:

1. Consulting feasibility studies, analysis
2. Custom software/programmingdesign, development
3. Computer Education and Trainingall types/forms
4. Facilities Management of user-owned IS equipment
5. System Integrationequipment, software, training

The focus of the interview is on 1985 for historical results and the next 12 to 24 months for forecasts.

1.0 PROFESSIONAL SERVICES (PS) OPPORTUNITIES

1. What portion of total business is related to Professional Services in terms of:
a. Total revenues _____% b. Total (BT) earnings _____%
2. How is your Professional Services business distributed among the following Professional Services segments:

Professional Services Segment	1985 Revenue
-------------------------------	--------------

- | | |
|---------------------------|--|
| a. IS Consulting | |
| b. Software Development | |
| c. Education and Training | |
| d. Facility Management | |
| e. System Integration | |

3. What is your estimate of the change in your Professional Services business (Percent) for 1986: a. In revenues _____%

If Declining, Please Explain Why? _____

4. For your Professional Services business, estimate its distribution among the following types of buyers:

Services	F 500 \$.4B +	Medium \$.1-.4B	Small \$.1B	Government Public
----------	------------------	--------------------	-----------------	----------------------

- a. Consulting
- b. Software Develop
- c. Education and Training
- d. Facilities Management
- e. System Integration

5. If you had a "windfall" of millions to invest in Professional Services markets, what specific type of services would you choose:

2.0 PROFESSIONAL SERVICES MARKET DEVELOPMENT

1. In the next 12 to 24 months, what do you think will have the most impact on the Professional Services markets.

a. Opinion _____

b. Office System and IS Integration _____

c. Voice and Data Integration _____

d. Mainframe and Micro Linkup _____

e. Video Disk DBMS _____

f. IS Staff Shortages _____

g. Overall Economy _____

2. What do you think will be the major changes in the competition for Professional Services business:

- a. Opinion _____

- b. Vertical Integration _____

- c. New Class of Competitors _____

- d. New Types of Services _____

- e. Consolidation/Mergers _____

- f. New Tools/Methods _____

- g. New Distribution Channels _____

- h. New Advertising/Promotion _____

3.0 COMPETITION IN PROFESSIONAL SERVICES

1. Who do you compete against most directly: _____

2. Rate your concern (10 = Most, 1 = Least) regarding competition in Professional Services from the following sources:

- | | |
|----------------------------------|--------------------------------------|
| a. IBM _____ | b. AT&T/T _____ |
| c. Mainframe Software Cos. _____ | d. Micro Software Cos. _____ |
| e. RBOCS _____ | f. Timeshare Services _____ |
| g. Big 8 Account. _____ | h. Large Management Consulting _____ |
| i. Lg/Nat. Retail _____ | j. Small/Local Retail _____ |
| k. Other (9/10) _____ | |

4.0 KEY FACTORS FOR SUCCESS IN PROFESSIONAL SERVICES

1. What do you believe is the most significant factor for success in these Professional Services markets: _____

2. What new skills are needed in being successful in Professional Services markets:

a. Opinion _____

b. Computer based Training _____

c. Software Integration _____

d. Ongoing Maintenance _____

e. New Methodologies _____

f. New Program Language _____

g. Industry Experts _____

3. What types of working arrangements are you considering to enter/expand Professional Services business:

a. Opinion _____

b. Licensing _____

c. Joint Ventures _____

d. Acquisition/Mergers _____

e. Marketing Agreements _____

5.0 TARGETING PROFESSIONAL SERVICES MARKETS

1. How do you pick your Professional Services markets (i.e., market selection strategy):

2. How do you select your prospects:

3. How do you promote your Professional Services business:

4. Rate these product areas in importance (10 = most important, 1 = least important) to your Professional Services business in next one to two years:

- | | |
|---------------------------------|-----------------------------------|
| a. IS Training _____ | b. Spreadsheet Design _____ |
| c. Data Base Setup _____ | d. Custom Micro Program _____ |
| e. Electronic Mail _____ | f. Mainframe and Micro Link _____ |
| g. Micro Application Doc. _____ | h. Data Security _____ |
| i. Infor. Center Setup _____ | j. Decision Support _____ |
| k. Expert System _____ | l. Voice and Data Network _____ |
| m. Voice Mail _____ | n. Electronic Graphics _____ |
| o. Others (9/10) _____ | |

6.0 IMPROVING REVENUES AND MARGINS

1. Estimate GROSS profit margins on your Professional Services business.
2. What are your strategies for improving GROSS profit margins for these Professional Services businesses:

END OF VENDOR SURVEY

APPENDIX C: RELATED INPUT REPORTS

APPENDIX C: RELATED INPUT REPORTS

- Market Trends in Professional Services.
- New Professional Services Opportunities.
- Federal Government Professional Services Market, 1985-1990.
- Software Product Pricing Trends and Opportunities.
- System Integration Markets, 1985-1990.
- U.S. Information Services Vertical Markets.
- U.S. Information Services Cross-Industry Markets.
- Information Services Vendor Financial Watch.

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs.

Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed in 1974, INPUT has become a leading international planning services firm. Clients include over 100 of the world's largest and most technically advanced companies.

Offices

NORTH AMERICA

Headquarters
1943 Landings Drive
Mountain View, CA 94043
(415) 960-3990
Telex 171407

New York
Parsippany Place Corp. Center
Suite 201
959 Route 46 East
Parsippany, NJ 07054
(201) 299-6999
Telex 134630

Washington, D.C.
11820 Parklawn Drive
Suite 201
Rockville, MD 20852
(301) 231-7350

EUROPE

United Kingdom
INPUT
41 Dover Street
London W1X 3RB
England
01-493-9335
Telex 27113

Italy
Nomos Sistema SRL
20127 Milano
Via Soperga 36
Italy
Milan 284-2850
Telex 321137

Sweden
Athena Konsult AB
Box 22232
S-104 22 Stockholm
Sweden
08-542025
Telex 17041

ASIA

Japan
ODS Corporation
Dai-ni Kuyo Bldg.
5-10-2, Minami-Aoyama
Minato-ku,
Tokyo 107
Japan
(03) 400-7090
Telex 26487

